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ABSTRACT

As part of a restructuring initiative to meet the curriculum needs of the "Information Age," a plan for teaching telecommunications to middle school students was developed. The resulting program, called Bulletin Board Simulator (BBS), provided a hands-on approach to teaching students the skills necessary for accessing an electronic bulletin board system or information database. This instructional method was deemed essential in maintaining a high level of interest while making the course objectives relevant and meaningful to all of the students. The success of the program was evidenced by a significant increase in the target group's scores on a communications skills assessment test, compared to the scores of the non-target group. The course objectives were easily completed by all the students who were provided with the hands-on practice, compared to only 25 percent completion of these skills by the non-target group. The target group's self assessments revealed a more positive attitude toward learning about technology as a result of the program, and most students expressed a realization that this type of learning and technical ability would have an impact on their success in the future. (Seven appendices contain the evaluation instruments, student progress chart with the course objectives, the SimBBS program, and source code.) (TJQ)

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ED 373 879

A PROGRAM FOR TEACHING TELECOMMUNICATION SKILLS AT THE MIDDLE SCHOOL LEVEL

by

Catherine A. Brett

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A Practicum Report

Submitted to the Faculty of the Center for Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Master of Science.

The abstract of this report may be placed in a National Database System for reference.

June/ 1993

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ABSTRACT

A Program for Teaching Telecommunication Skills at the Middle School Level.
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As part of a restructuring initiative to meet the curriculum needs of the "Information Age," this plan for teaching telecommunications was developed. The Bulletin Board System (BBS) simulator provided a hands-on approach to teaching the skills necessary for accessing an electronic bulletin board system or information database. At the middle school level, this instructional method was essential in maintaining a high interest level while making the course objectives relevant and meaningful to all of the students.

The success of the program was evidenced by a significant increase in test scores of the target group compared to the test results of the non-target group on a Communication Skills Assessment Test. The course objectives were easily completed by the students who were provided with the hands-on practice as compared to only 25 percent completion of these skills by the non-target group.

A much more positive attitude towards learning about technology was conveyed in the target groups' self-assessments. Most students expressed a realization that this type of learning and technical ability would have an impact on their success in the future. Appendices include the evaluation instruments, student progress chart with the course objectives, the SimBBS program and source code.

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CHAPTER I

Purpose

To meet the goals set up in the Blueprint 2000 plan for school improvement and accountability, schools across the nation are restructuring curriculum. This restructuring emphasizes information retrieval and communications technology in all curriculum areas.

In an effort to recognize this shift in paradigm the subject school included comprehensive technology goals in its five year plan for school improvement. The program for teaching telecommunication skills was a first step in realizing some of these goals.

This program was undertaken in a county school district on the southeast coast of Florida. The population of the county at the time of the study was 1,105,000. The county accommodates over 115,000 students through 75 elementary schools, 20 middle schools and 23 high schools.

The district is geographically divided into three areas: north county, south county and west county. The subject school lies within the boundaries of the west area. Built approximately 10 years ago to service 800 students, the

schools' population this year reached 1820 and continues to grow.

Rapid growth in the area and overcrowding necessitated moving one grade level to another school site five miles from the subject school. This additional school site was referred to as the sixth grade annex.

This project took place at the original school site that now serves only the seventh and eighth grades. The student population was over 1200 for these two grade levels. Due to budget cuts, a cutback in staff and the overcrowded situation, the average class size for the 1992-1993 school year was approximately 35 students.

The administrative staff consisted of one Principal, one assistant principal for curriculum, one community school principal, three grade level assistant principals, and one guidance counselor.

The two school sites shared 93 teachers, most of whom were teaching in their areas of certification. There were several teachers who traveled between the two school sites because of their areas of specialization.

There were four teachers directly involved in teaching computer applications or programming. Two of these teachers were certified in computer science the writer being one of them. These teachers shared four computer labs with 65 computers for student usage. Most of the computers are the IBM PS2 model and two of the classrooms were networked using Novell, with 35

computers attached to a file server.

The community surrounding the subject school has nearly tripled in size in the past three years. Families have moved to the western suburbs from the coastal neighborhoods to find more affordable housing and better, or at least more contemporary, educational facilities for their children.

The students come from diverse backgrounds and socio-economic levels. While many parents are college educated, many students come from single parent homes or homes where the parents have less than a high school education. This diversity results in some students having a degree of competency in computer skills while others will have had little exposure to computers, if any at all.

Students' ages range from 11 to 16. The breakdown of the ethnic population of the school is as follows: White (75%), Black(13%), Hispanic(11%), and Asians(1%). There are 670 boys and 568 girls in the seventh and eighth grades.

The writer of this project graduated from college with a B.S. degree in education. Since 1972 she has taught in the Florida public school system. During the late 1970s, while Florida was experiencing a shortage of math teachers, the writer became certified in math and taught math at the seventh and eighth grade level for the next ten years. For the past three years she has

been teaching in a computer lab set up to remediate and review basic math skills. Before being assigned to the computer lab, she taught math and music at the subject school, at times teaching both subjects in the same year.

After a successful year using a Computer Assisted Instruction (CAI) program, the writer became determined to obtain certification in the area of computer science. This certification prompted the administration to ask her to take on some additional responsibilities this year.

Some of the writer's responsibilities included operating the Novell network and making sure all of the seventh graders had completed the math remediation program run on this network. Another duty included training the teachers to use the computerized grading system that is available on the network.

The most consequential responsibility was that of developing course objectives and lesson plans and implementing those objectives and plans in a computer applications course with an emphasis on communications. Selection and installation of the necessary communications software for implementing the telecommunications class were left up to the writer. This included installing and operating the school's electronic bulletin board system. (BBS)

Finally, the administration requested a budget proposal for next year and a telecommunications course evaluation be submitted by the writer. This report was to contain recommendations as to whether or not such a course should be

considered for next year at both the seventh and eighth grade levels.

Problem Statement

In 1990 President Bush issued a challenge to educators to reshape the traditional methods of pedagogy and prepare for an era of technology that would be facing our nation's students in the year 2000. To meet this challenge, school districts are making an effort to incorporate technology training along with the basic academic subjects. This trend brings about as many questions as it provides answers.

Most of the schools in America have some type of computer lab setup, but in almost every case the students outnumber the computers by at least 30 or 40 to one. In the subject school, four computer labs were being utilized to their maximum potential but the problems arose when there were more students in the class than there were computers.

The administration approached the author at the beginning of the 1992-1993 school year and asked if it would be possible to implement another computer applications class to help accommodate students on the related arts wheel. The specifications for this class were that it was to be taught for a nine week period and all seventh grade students would be scheduled for the class. Since all of the seventh graders were already scheduled to take a computer

course on the related arts wheel that primarily dealt with programming in Logo, the administration specifically requested that this course be a computer applications course.

During the summer months, the author had the opportunity to take courses via telecommunications and Donald Joslyn's electronic classroom (ECR) through Nova University. Convinced that telecommunications would be an important component of the School Year 2000 project the author decided to accept the challenge and implement a nine week course of innovative computer applications with an emphasis on telecommunications. Because telecommunications is relatively new in the educational arena, the material available in the form of lesson plans or texts was virtually non-existent.

During the first nine weeks the problem of too many students and too little actual "hands-on" activity became apparent. In a telecommunications class with only one dedicated phone line and one modem, only one student at a time can actually work online. Even if they work in groups, the maximum number of students who can actually participate in online activities simultaneously is four.

What then, do the majority of the students do? Obviously, the ideal situation would be to have all of the computers networked to the modem and then each student would have access to the online services and bulletin boards.

Budget constraints would not allow this.

So, although the computers were networked to a file server they were not networked to the modem. This resulted in 97 percent of the class being off-task during the activities that involved online performance or skills.

The writer realized that if the students were not provided with a "hands on" learning environment they also would not develop the skills necessary to be proficient at using telecommunications. The students who had computers and modems at home had an advantage but the majority of the students had never been exposed to telecommunications before this class.

The results of a Skills Assessment Pre-Test (Appendix A:45) administered to 58 students the first day of class during the last term, clearly indicated a lack of any prior knowledge or awareness in the area of communication technology. The results showed that 85 percent of the students taking the test received a score of less than 50 percent with the mean score being 35 percent.

After interviewing the students individually, it was discovered that the students who earned a grade of above 50 percent had a computer at home and had already been exposed to telecommunications in some way. There were only two out of 58 students who passed the test and the highest grade was a 70 percent. These results indicate a need for an introductory level course in telecommunications.

Even more discouraging was the lack of achievement or progress for those students who did not own a computer at home. Most of these students did not complete the ten course objectives and they only increased their scores on the Post Skills Assessment Test by about 30 percent.

A university professor, in his Research Questions in Telecommunications, asks "Is it possible that the use of telecommunications will only result in a broadening gap between the "haves" and the "have nots"?" The test results and lack of progress for the majority of the students in the first nine weeks term seemed to endorse this view.

In an effort to find out if other teachers using telecommunications in the classroom were having the same type of problem, the writer used a survey program and placed it on the school's electronic bulletin board system. (Appendix B:50). At the suggestion of Practicum Advisor Paul Wessen, the survey was also distributed in text form to teachers in other states and districts through a commercial Bulletin Board System.

There were ten local technology teachers who completed the survey and 24 teachers from several states across the country who responded. One hundred percent of these teachers expressed interest in a program that would provide a "hands on" method for teaching the basic course objectives for telecommunications to the entire class.

A simulated Bulletin Board System (BBS) seemed to be the answer to this problem. Most of the participants in the survey taught in a classroom with at least 15 to 20 computers or more. These teachers indicated that if there were a program that could provide practice with the procedures of accessing and exploring a BBS, students would be more successful at mastering the basic communication skills. This type of program could make the class more meaningful and relevant to those who do not have a computer at home. It also would be a step toward closing the gap between the "haves" and the "have-nots."

Outcome Objectives

An integral part of the Blueprint 2000 plan for school improvement and accountability is that students will integrate their knowledge of how technological systems work with their ability to analyze trends, design, and databases and use the appropriate technology to access these resources to enhance their current mode of instruction. The program proposed for this practicum was designed to eliminate any disparity among the students with different socio-economic backgrounds and provide each student with a means of becoming familiar with the skills necessary to accomplish these ends.

The following objectives were established to determine the effectiveness of this program:

After the nine week course in a telecommunications class using the Bulletin Board Simulator program, 80 percent of the target group will demonstrate an increase in their comprehension of telecommunications by scoring 85 percent, or better, on the Communication Skills Assessment Post Test. (Appendix A:45)

After a nine week period using the BBS simulator 100 percent of the target group will complete the ten course objectives as compared to only 25 percent of the previous non-target group. The completion of these skills will be evidenced by collecting the Student Progression Reports at the end of the nine weeks. (Appendix C:54)

Ninety percent of the target group will possess a positive attitude toward learning more about new technologies and telecommunications after a nine week period using the BBS simulator. This attitude change will be evident in the results of the self-assessment activity the students will complete at the end of the course. (Appendix D:56)

After a nine week period using the BBS simulator in the telecommunications class 95 percent of the target group will be on-task during the online activities as compared to only 3 percent in the preceding nine weeks class. This result will be monitored by the teacher and evidenced by the number of students completing the course objectives in the target group

compared to the number of students who completed the course objectives in the non-target group.

After a nine week period the students will demonstrate the ability to access a "real" BBS and use critical thinking skills to locate the necessary files or directories to solve a given problem as evidenced by the teacher's observation of the individual students while working online.

CHAPTER II

Research and Solution Strategies

The 21st century is fast approaching and various economic and education forecasters have referred to this as the "Information Era." There is no doubt that the computer will become more than just a computing device in this next century. The computer's ability to access large volumes of information instantly from anywhere in the world makes it an essential tool for many businesses.

This reliance on telecommunications technology to transfer financial records, funds and informational data quickly, efficiently and safely will define the "Age of Technology."

As Wirth (1993) points out, the change from action-centered skills of physical production that characterized the industrial era to work marked by abstract intellective skills will require a complete restructuring of our educational system.

It becomes the responsibility of our educational system to prepare our students for a future in which a knowledge of telecommunications, what it can do and how it is accomplished will be essential. Our public schools must

recognize and accept this responsibility if our students are to meet the challenges of a global economy. (Daughenbaugh, 1991)

The laws, policies and regulations that govern telecommunications are made at the Federal level. Therefore, business and industry leaders are actively involved in these policies and regulations while educational leaders are rarely consulted or included in this decision making process. Many of these decisions will have an impact in the near future on American schools because it concerns the delivery of a multitude of educational and informational services produced by the private sector. Weinstein and Roschwalb (1990) cite Senator Albert Gore and his solution to legislate a "national superhighway for computer information" that will have a tremendous impact on education in America in the coming years. It will become the task of America's teachers to make this superhighway of information and resources accessible to our students.

The government, in an effort to improve national productivity and competitiveness passed legislation known as the High-Performance Computing Act of 1991. This legislation authorized the "information superhighway" that had been proposed by Senator Albert Gore in 1988. The intent of the legislation is to improve the information,computing, and communications infrastructure for the country's researchers and educators while it serves to promote the development of new computing and communications technologies.

(Bishop, 1991)

Government plans for the NREN over the past year have evolved to put a much greater emphasis on educational and library perspectives. As new users and applications are brought online, the potential for dramatically transforming the educational system in this country is becoming apparent. In some cases, the computer networks are simply updating an old system and making it more efficient and more available to everyone. An example of this is bringing the nation's libraries, more specifically the card catalogs online and making that information accessible to everyone.

In other cases, computer networking can create new relationships, processes and services. An example of this would be students learning another language can engage in conversations with other students who are native speakers of that language. By accessing the Internet, students at the subject school experienced this type of relationship with a class of bi-lingual, elementary students from another state. The middle school students read and responded to letters written to them in another language, helping the younger students to understand colloquial, English expressions. Development of the NREN has the potential to expand even further the use of computer networking services and products in schools, universities and libraries.

It would seem that administrators and educators would be anxious to

include telecommunications in their classrooms and schools. However, as Watson noted, "between the infancy and the adulthood of on-line communications stand years of haggling between educators raised on the book and those hooked on the byte." (Watson, 1990:109) There are those who view computer technology as a threat to the traditional school and the teacher-student relationship.

The proponents of online classrooms and using communication services view telecommunications as an ally in restructuring the schools of the future. Grunwald (1990) envisions several possible scenarios, all positive, which may be the result of the implementation of telecommunications. Some of these include the parental involvement that might occur when the parents can actually conference with teachers online, check homework or classroom activities online and interact with other parents or administrators without even leaving their homes.

Parents of several students at the subject school became involved and excited that they could actually experience and learn some of the techniques their children were learning by logging into the school's BBS. This enthusiasm on the part of the parents became contagious as the students realized they could actually teach their parents something new and show them what they had learned about technology in school.

Next, students who normally find it difficult to participate in a normal classroom setting because of physical appearance, race, gender or disability will find the computer remains neutral to all of these characteristics and focuses only on ideas and expression. For these students, on-line communication could mean a new sense of self efficacy.

This form of self-expression was realized by a number of students from other schools who accessed the subject school's BBS throughout the year. There were classes for the hearing impaired who logged on regularly to "chat" with students in the telecommunications class. There was a class of blind, or visually impaired students from a local high school who logged in on a regular basis to communicate with students at the subject school. Finally, there was a teacher of Emotionally Handicapped students who allowed the students to logon to the subject school's BBS as a reward for good behavior during the week.

Another goal of educators could be realized, and that is lifelong learning. With on-line classes being offered to adults and dropouts, people of all ages could continue their education and work their education into their busy work schedules.

The role of the teacher will change because it has to. The teacher will no longer be viewed as the source of all information but rather as a manager or a

guide for the students' explorations. Teachers who like to think of themselves as taskmasters may find this a threat, but realistically, in this era of specialization none of us can be so well rounded in all areas as to know everything there is. We can, however, be knowledgeable about what resources are available and what databases will contain the information necessary to solve a particular student's problem.

Yet, with all of the advantages mentioned above the educational system is still reflecting its 19th-century technological roots. Mecklenburger (1990) notes that chalkboard, lecture, and textbooks continue to dominate classroom instruction in America while other countries employ communication technology to enhance their classroom.

As new technologies are introduced into the classroom much of what educators call the "real world" will be brought into the classroom. Also, much of what is known as "school curriculum" can go anywhere. This electronic learning is one of the great inventions of the 20th century but will see much more use in the 21st century.

Much of what is being done today in most schools is still experimental and largely done on a small scale because of several factors. An administration that suffers from technophobia coupled with a large amount of skepticism by most of the faculty are two reasons. Then there are budget concerns, the funds just

aren't there to upgrade the equipment or provide for the necessary technological training it will take to utilize the informational networks available.

In his article The Wired Classroom: American Education Goes On-Line, Watson (1990) itemizes the minimum hardware and software necessary to get a telecommunications class up and running. These items include a computer sizable enough to handle a modem that will cost about $1,500. The modem will run between $50 for a 2400 baud and $150 or $250 for the latest high speed modems running at 9600 baud or greater. The communication software needed to turn keystrokes into online text will cost another $50. Last, but most important, for the school to begin thinking about utilizing this equipment a dedicated phone line needs to be installed that may cost the school several hundred dollars a year.

In addition to the above costs, the writer decided to install an electronic bulletin board at the subject school to allow for more interaction between the schools in the county. This software cost the subject school an additional $100.

Perhaps it is time to bring big business into the public school environment and encourage input both technologically as well as financially. It would seem that may be the only answer to obtaining the necessary ingredients, the essential hardware and the technological training to convert the 19th century classroom into a 21st century learning environment.

Solution Strategies

McFarland questions in his Telecommunications and the Global Community

> ... is it possible that the use of telecommunications and technology-based instruction as an instructional medium is perceived as an entity so closely identified with instruction that faculty and students cannot separate the course from the delivery mode?

It would seem there is a necessity to treat technology-based instruction as just that, an entity, and treat it as a means of enhancing the other disciplines as well as a vehicle for expanding the traditional methods of pedagogy and information gathering.

The idea of a class devoted specifically to instruction in telecommunications came about as a result of the writer's own exposure to such requests during an Electronic Classroom (ECR) Session while taking a course online at the graduate level. At the time, there were students online who expressed concern that there hadn't been enough instruction given in the operation of the UNIX environment to allow them to feel comfortable enough with using UNIX to complete successfully the required course assignments. Many felt that a course in uploading and downloading, using the various protocols and setting parity, data bits and stop bits should have been one of the pre-requisites to taking such a class.

With this in mind, the idea of exposing students of middle school age to the skills necessary to access the various databases and informational resources available through telecommunications became the impetus for agreeing to teach the innovative computer applications class.

To enable the average middle school student to complete successfully the requirements of this type of class, the writer decided the only solution would be to provide a "hands-on" BBS simulator. (Appendix E:58) This simulator would allow each student to practice logging on and off a BBS. It also would allow each student to develop a level of competence with the basic routines to enable them to use a real BBS without apprehension or assistance.

The simulator would serve two purposes. First, the students could work through their activities offline until they felt comfortable enough with the procedures to access a real BBS on their own. Secondly, the simulator would provide those students who did not have access to a computer or modem at home the opportunity to experience first hand the activities and skills that were needed to enable them to take advantage of telecommunications.

After reviewing the literature available on the subject of teaching telecommunications, the writer found a BBS simulator program that had been developed by Richard Daughenbaugh in 1989. The program itself was written in BASIC and it was already outdated and inappropriate for the

equipment that was currently being used at the school site.

In an effort to match the simulator as closely as possible to the BBS software being used, the writer decided to write the program in Pascal (Appendix E:73). The program incorporated a menu format that was similar to that of the actual BBS software being used at the school. It also contained a text editor to allow the students to compose their electronic mail messages and save them on their disks. This effort to make the simulator as authentic as possible provided the students with a sense of familiarity and confidence when using a real BBS.

CHAPTER III

Method

Before the idea of the BBS simulator program was even contemplated, the writer had consulted and discussed with the Principal and project mentor some of the ramifications of trying to implement a telecommunications class at the middle school level. Discussion about budget concerns and funding for the program took place during pre-school planning. The community school principal offered additional funding if the program could be implemented and used as part of the community school educational program. It was decided that in order for the school to make any progress in the area of technology the writer would implement the program with whatever funds were available.

A "bare bones" budget was presented to the Principal and the community school principal, and a dedicated phone line was ordered and installed in both classrooms where the telecommunication classes would be taught. Next, the Principal authorized the use of a 386SX computer with a 2400 baud internal modem specifically for teaching this class. The development of course objectives, software and teaching strategies were left up to the writer.

During the first nine week term the writer decided it would be advantageous to set up a BBS at home for demonstration purposes. The students could log onto the teacher's board instead of using public boards that may contain some files or material inappropriate for the classroom setting. The software used on the instructor's home BBS was Searchlight by Frank La Rosa. To insure some continuity it was decided to use this same software for the school's BBS.

The writer then decided to install Telemate by Tsung Hu on the school's computer because of the flexibility of the program. This program would allow students and faculty to use the modem to access local bulletin board systems in other schools.

After getting the hardware and software in place, the difficult task of deciding exactly what should be taught and how it should be taught was of primary concern. A careful computer search for any literature or previously used lesson plans in the area of communications technology was done. This search turned up surprisingly little in this area. Aside from a book entitled Telecommunications in the Classroom published by The International Society for Technology (ISTE) there was little else to be found. The first nine weeks of school was spent developing course objectives and lesson plans for the telecommunications class.

A problem that kept resurfacing during the first semester was that of keeping 28 to 30 students on task while one student would work through an activity online. Most of the students did not complete the ten objectives and activities for the nine weeks simply because there wasn't enough time for them to work online. The only students to finish the course requirements were those with computers and modems at home.

This inequity needed to be addressed. The only solution seemed to be to have all of the students working online simultaneously. The idea of networking all of the computers to the modem was presented to the Principal for consideration but was rejected because of a lack of funds at that time. The only other solution would be to implement a BBS simulator in which each individual student could work through the activities offline until they felt secure enough to access a BBS online.

To learn if any other teachers using telecommunications had used a simulator program or knew of one, the writer sent out questionnaires via electronic mail locally and then used a commercial bulletin board system to see what teachers in other states were doing.

The writer heard from ten teachers locally and from teachers as far away as California and Hawaii. Although these technology teachers expressed interest in a BBS simulator program, none of them had such a program available.

Another computer search was done and the simulator program developed by Daughenbaugh (1989) was discovered. This program had been written in BASIC for the APPLE computer and although the program was only four years old, it was technologically out of date and of little use at the school site.

The writer found it necessary to develop a contemporary simulator that could be used to demonstrate some of the features that the latest electronic bulletin board systems had to offer. This program was written in Pascal and modeled after the bulletin board system used at the school site.

Actual implementation of the BBS simulator program began the first week of the last nine week term. Fifty-five students were given a Skills Assessment Pre-Test on the first day and the results were much the same as the previous groups' test results. Only five percent of the students passed the test with 80 percent of the students scoring below a 50 percent.

Each student received a Progression Report Form (Appendix C) during the first week that listed the course objectives for the telecommunications class. Individual diskettes with the BBS simulator program on them were then distributed to the students. The students were asked to put their names on the labels and to use this disk for the entire nine week period. A student hand-out called "Activity One-Registration" was distributed. This student hand-out explained in detail the steps required when first registering to a BBS.

After reading through and discussing the procedures for logging on and registering to a BBS, the class was instructed to boot-up their computers with DOS disks and then type in SimBBS to run the simulator program. The writer assumed the students would have no difficulty getting to the registration menu and the remainder of the class would simply be a matter of allowing them enough time to complete the registration and then initialing their progression charts as they completed the first assignment.

What was not taken into account was how apprehensive most people, including students, are when faced with an unknown concept. This is especially true when the computer is involved. Hands went up immediately for help and most of the first day with the simulator was spent explaining individually how to register to the BBS. Although 50 percent of the students completed the registration process the first day, it was not an auspicious beginning for what was hoped to be a successful hands-on activity.

The writer determined that there was not enough instruction in the actual program. It was decided to create pop-up help files for the students to read as they progressed through the program. These files were placed throughout the program wherever a problem was anticipated. The first of these "pop-up" help files was placed in the opening screen explaining to the students that they would have to read the file in order to proceed.

The second week of using SimBBS went much more smoothly because the students now had the instruction on the screen. During that week the students were to taken through the registration process again but this time they were to send an electronic mail (email) message to the sysop.

Many of the activities for course completion required using an editor to compose email. Therefore, it was decided that the BBS simulator would contain a text editor to allow the students to compose their "E-Mail Activities" offline and then copy or upload these files to an actual BBS. To make this possible, another small program needed to be written to convert the email data files into ASCII files. This program was called "changer.pas" and the students needed only to type in the word 'change' and the file name, without the extension, to convert their files to ASCII. (Appendix F:106)

Prior to the third week, arrangements were made with teachers in other schools who were also introducing telecommunications to their classes to allow the students to communicate with one another. This inter-school communication was arranged to demonstrate how the email concept would work. Because of the nature of this type of class, the activities and projects for the following weeks overlapped and were ongoing.

During the third week the students were introduced to the concept of sub-boards, conferences or SIGS(special interest groups.) Each student joined a

sub-board and posted an introduction to that sub-board. This was first done on the simulator and then transferred to the school's BBS. Students from another school then logged in and responded to each posted introduction. This provided the students with a sense of reality and accomplishment as they formed new relationships with students from other schools who shared some of the same interests.

The fourth week involved more communication between schools. The "E-Mail Activity" for this week was called "E-Mail vs. Snail Mail." Snail mail being a reference to the United States Postal service. It was hoped to demonstrate to the students how much faster communication could be done electronically. Students composed two letters to students in other schools. One was sent electronically the other was sent via the U.S. postal system. The students in the other schools responded in the same manner and a comparison of the different methods of communicating was made.

Week five involved a mid-term evaluation. The students were instructed to complete "E-Mail Activity #4" that was entitled "How much have you learned?" This activity was to be sent to a modem pal in another school and also to the Sysop, or instructor, for evaluation purposes.

The concept of uploading and downloading was introduced during week six. The students were able to use the simulator to practice accessing the files

directories. They were also able to practice uploading or downloading a file and selecting the protocol for the file transfer. Discussion of the differences between a text file and a zipped file was necessary to explain to the students why files were transferred in zipped or compressed form.

During week seven the students were instructed to compose a text file, save it in ASCII and upload it to the instructor's BBS. It was decided that the students would upload and download text files because they would transfer much more quickly than other file types. The students were given a hand-out that explained in detail the uploading procedure. They were told to practice this procedure using the simulator until they felt ready to try the actual upload.

Downloading files was the main objective for week eight. The students were again given detailed instructions in the form of a hand-out that explained how to find the file they were to download. The students practiced accessing the files directory on the BBS simulator, locating a file, selecting the protocol and then downloading it. When the students felt comfortable with the concept they accessed the instructor's BBS and performed the actual download.

The Skills Assessment Post Test was administered during the final week of the nine week period. When shown their grades from the Pre-Test the students were amazed that their scores had been so low on the previous test. Many students expressed a feeling of accomplishment when they saw how much they

had improved their scores on the Post-Test.

During the ninth week the students were to complete their objectives check list by making a hard copy of the file they had downloaded the previous week.

Each student used the simulator to work at an individual pace to complete all of the objectives and master the skills necessary to be successful in the course. Because the simulator was implemented during the last nine week term the results of the students who used the simulator were compared to the results of the non-target groups who worked through the course objectives without the "hands-on" practice. Those results will be reviewed in a later chapter.

Resources

The nature of this communications program obviously involved more than just the subject school, and so the success of the program depended a great deal on the cooperation of other teachers and students from other schools.

These teachers and students responded to the various E-Mail activities that were sent to them, providing students in the subject school with the necessary feed-back to make the course relevant and exciting.

At times, because of distance and cost, it was impossible for some of the participating schools to log onto the subject school's BBS. Therefore, the writer suggested sending any correspondence between the schools via the Internet.

This idea worked well, and the target group was able to communicate with students as far away as Hawaii and California.

Because of scheduling conflicts this class was taught in two different classrooms at the subject school. In one classroom, the computers were IBM PS2s and they were all networked to a file server. The second classroom had fourteen, older model IBM computers that were not networked and used only 5 ¼" disks.

This seemed to be only a mild inconvenience at first and it was hoped that the simulator could be used just as effectively in this classroom. So, the program was copied onto individual 5¼" disks and the students worked through the course in the same manner as the class using the PS2's. What happened was the text editor malfunctioned on the older computers. The students became frustrated because a line of text would overwrite itself or double when they tried to use the backspace key. The program was originally written on a 386SX computer and the text editor worked well on the upgraded equipment but not as well on the older computers.

To compensate for this, the program was used to demonstrate the various facets of the BBS and to simulate the upload and download procedures but the students used a different word processing program when typing their e-mail activities to make these assignments less frustrating.

Monitoring

The monitoring of student progress and the effectiveness of the simulator program was accomplished in several ways. The first method was the daily observation done by the writer to determine how many students were on task while using the simulator program in the target group. Teachers in adjoining classrooms were also used to help determine the effectiveness of the program for keeping the students on task. These teachers were asked to walk into the subject classroom at least once a week and observe the number of students on-task or off-task during the last semester. All of these teachers confirmed that at least 90 percent of the students were on task in the target group compared to a very small percentage in the previous non-target group.

Another method of evaluating the student progress was to check each disk individually to determine how many of the assignments had been completed correctly on the simulator. This evaluation was performed by the writer each week to assess how many students were progressing and mastering each skill.

It was during this part of the evaluation process that the writer realized a drawback to the BBS simulator program. While writing the help files for the students, the main focus was on the instructional capabilities of the program. Little thought had been given to how tedious these help files would become

when the instructor had to view each of them while checking assignments.

This problem was mentioned to Practicum Advisor, Dr. Paul Wessen, who suggested the help files be made optional. This idea was incorporated into the program at two points. The user has the option of selecting help files during the opening logon screen and then has the opportunity to turn the help files on or off with a toggle switch in the main menu. This made viewing and grading assignments a lot less frustrating and time consuming for the remainder of the year.

Implementation of the BBS simulator lasted for the entire nine weeks with each student using the program at least three days out of five. As the students demonstrated mastery of each skill they would present their progression charts to the instructor to be initialed and dated.

To demonstrate mastery of each skill the students had to complete the assignment on the BBS simulator and then logon to the school BBS or the instructor's BBS and repeat this process while the instructor observed and evaluated their performance.

Evaluation

The success of the BBS simulator program is reflected most clearly in the comparison of the results of the Post Telecommunication Skills Assessment

Test given to the non-target group with the results of the target group. Both groups had low scores on the Pre-Test with 50 percent or more of the students scoring less than a 70 percent. The mean score for the Pre-Test was 35 percent for both groups. While only 50 percent of the non-target group were able to increase their scores on the Post Assessment Skills Test by 50 percent, 90 percent of the target group increased their scores by 50 percent or more. The breakdown of Post Test scores for the target group are as follows: 30 percent of the students in the target group scored a 95 percent or above on the test, 45 percent of the students received an 85 or 90 percent on the test, 20 percent received a 75 or 80 percent and 5 percent of the students received a score of 70 percent or below.(Appendix G:109)

Another criteria for evaluating the success of the BBS simulator program was comparing the student progression charts of the non-target group to those of the target group. While only 25 percent of the students in the previous nine weeks classes were able to complete all of the course objectives. One hundred percent of the students in the target group were able to complete the ten course objectives and present a completed Progression Chart at the end of the course.

The final E-Mail Activity was used as another evaluation instrument. This activity was the students' own assessments of how much they had learned and

what they had derived from completing the course. The non-target group expressed how "boring" the course was when they weren't on the computer and the majority of these students couldn't see any relevance to learning this type of technology for use in the future.

The results in the target group were much more encouraging than those of the non-target group. Students in the target group expressed a much more positive attitude about learning telecommunications and expressed and interest in continuing this type of study in the future. Many of the students in the target group thought the most exciting aspect of the course was meeting students from other schools in different areas of the country and being able correspond with them via telecommunications.

CHAPTER IV

Results

The implementation of the BBS simulator program was extremely beneficial in helping the students in the target group master the course objectives and develop competency with the communication skills.

After administering the Skills Assessment Post Test during the last week the results were tabulated and compared. The students from the target group scored considerably higher than those students in the previous non-target group. Only 35 percent of the students in the non-target group were able to score an 85 percent or better while 65 percent of those students scored 80 percent or less. In the target group 75 percent of the students were able to score 85 percent or better with only 25 percent of the students receiving a score of 80 percent or less.

Another benefit of the simulator was the gap between the "haves" and the "have-nots" was narrowed. Although only 25 percent of the students in the previous non-target groups were able to complete the required course objectives, one hundred percent of the students in the target group completed

these skills. This evaluation was accomplished in two ways. As the students completed a skill on the simulator they would then ask the teacher to initial their student progression chart. Before this was done, the student had to demonstrate mastery of the skill by accessing the school BBS or the instructor's BBS and repeating the procedure as the instructor observed the student's competence level.

The students in the previous nine weeks classes were reluctant to even try this and would continually rely on the instructor for assistance. The target group was just the opposite. They were anxious to try the procedure on the actual BBS and resented any interference by instructor at "coaching" them or helping them along. One hundred percent of the students were able to complete the course objectives and some of them did this before the end of the nine week period.

The last method of evaluation was probably the most important to the writer because the ideas, concepts, objectives and strategies for teaching this type of class originated with her. Students in the previous nine weeks experienced a frustration at not being able to access the modem or BBS and indicated that they saw no relevance to the course. This was revealed in their final E-Mail letters, which was actually a course evaluation. They expressed a frustration at not being able to comprehend what was being taught because they

couldn't actually "do it." The target group on the other hand, was much more enthusiastic about the course and expressed a desire to continue learning more about telecommunications and technology next year. Many students said they had computers at home but their parents never used the modem because they didn't understand how it worked until some of this course information was taken home.

The target group was able to ascertain the relevance of the course because they were able to participate actively. In the previous nine weeks, the students would complete the E-Mail assignments, but the instructor would be responsible for uploading them because the students just weren't capable at that time. In the target group, the students became so adept at working with the communications programs that they could actually log onto other systems and access them without the aid of the instructor.

CHAPTER V

Recommendations

The administration has requested that the writer of this project apply to the State Department of Education for a course number so that the course can officially be called telecommunications. Plans for next year include teaching the course at the seventh and eighth grade levels for a semester instead of a nine week period. This necessitates the development of more curriculum objectives, lesson plans and student activities for the coming year.

The unique nature of a telecommunications class and its success depends a great deal on the cooperation of other schools, teachers, districts and states. During the past year the writer has become familiar with many people online and word of the project has spread as an interest in using telecommunications in the classroom is becoming more popular. Several teachers from other counties have visited the subject school to observe how a class using telecommunications can be taught. Many of these teachers requested lesson plans and asked that the BBS simulator be sent to them upon completion.

One of the visitors to the subject school came from a school in another

county. This school had won the Retrofit Grant and was in the process of restructuring its curriculum. The writer was asked do a workshop at that school in the upcoming year to help the teachers understand how technology can be used to enhance their curriculum.

Plans to conduct a "brain-storming" workshop at an upcoming technology convention as been suggested to the writer. Several teachers from various counties in the state will be meeting at this convention to exchange ideas and develop activities for some inter-school projects for next year. The writer was asked to organize this workshop.

A result of placing the Technology Teacher Survey on the commercial bulletin board system was that teachers in other parts of the country became interested in the project. The writer was asked to submit her lesson plans to a nationwide bulletin board for other interested teachers to download. Five units of telecommunications lesson plans were placed on this board for download at the end of April. At last count, there were over one hundred twenty downloads of these plans.

This project also received exposure because of the writer's use of FIRN and the Internet. The editor of the FTEQ (Florida Technology in Education

Quarterly) is reviewing the lesson plans for future publication in that Quarterly. A synopsis of the project can be found in the April CECA (Connecticut Educators Computer Association)newsletter. The writer was also asked for permission to publish the justifications for a telecommunications class by an instructor at the University of South Africa. This individual is trying to initiate a change in that country's educational system by promoting the use of communications technology .

It is hoped that the BBS simulator can be enhanced to include more activities for next year. The writer would like to incorporate the quizzes and tests for the class into the program, so that all of the student activities can be completed and graded on a disk. It is also hoped that this program can help make the transition from traditional methods of instruction to technology based instruction a less challenging prospect for those who are charged with initiating this change.

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APPENDICES

Appendix A

TELECOMMUNICATIONS
SKILLS ASSESSMENT TEST

MULTIPLE CHOICE

1. The process of transferring data and information electronically from computer to computer over the phone line is called
   a) Simulation
   b) Animation
   c) Telecommunications
   d) Database Transfer

2. The rate or speed at which data is transmitted over the phone line (usually measured in bits per second) is called
   a) Buffer
   b) BAUD
   c) Duplex
   d) Noise

3. The rules that computers exchange in order to establish how a file (or files) will be uploaded or downloaded are called
   a) Peripherals
   b) Output
   c) Buffers
   d) Protocol

4. A series of networks connected together that enables you to send messages to any address around the world is called the
   a) BitNet
   b) Internet
   c) Spacenet
   d) WanNet

5. A low level word processor that allows composing and editing messages online is a
   a) Carrier
   b) Public Domain
   c) Sub-board
   d) Text Editor

6. The process of transferring a file from your computer to a host computer is referred to as
   a) Shareware
   b) Downloading
   c) Uploading
   d) Protocol

7. When you save a text file for upload you usually save it in
   a) ASCII
   b) ANSI
   c) BASIC
   d) LAN

8. When you save a text file in Writing Assistant the extension you use is
   a) .ANS
   b) .BIT
   c) .TXT
   d) .PCX

9. A blinking light or rectangle on the screen that indicate where the next character is to be typed is called the
   a) Disk
   b) BIT
   c) BYTE
   d) Cursor

10. To make a disk ready for use or prepare it to accept data is to
    a) Access
    b) Format
    c) Backup
    d) Delete

11. The person in charge of running a BBS is called the
    a) Host
    b) Sysop
    c) SIG
    d) Text Editor

12. The process of entering your name, user Id and password to gain access to a BBS is called
    a) Hacking
    b) Handshake
    c) LogOn
    d) XON-XOFF

13. A list of choices or commands that come up on the screen to help you find a specific area on the BBS is called the
    a) Menu
    b) Modem
    c) Network
    d) Protocol

14. The process of transferring a file from a host computer to your computer is referred to as
    a) Copying
    b) Deleting
    c) Downloading
    d) Uploading

15. Software available on most BBS's that allow you to download programs and try them before you buy them is called
    a) Commercial
    b) Public Domain
    c) Shareware
    d) Write-Protected

16. The secret word you need to gain access to most BBS's is known as the
    a) Alias
    b) Handle
    c) Password
    d) UserID

17. A phone line specifically used for telecommunications is referred to as
    a) Dedicated
    b) Interfaced
    c) Networked
    d) UNIX

18. A unit that changes computer signals into sound waves so that data can be sent and received over telephone lines is the
a) Mainframe
b) Modem
c) Mouse
d) UNIVAC

19. Static on the phone line which may cause undesired characters to be sent or received by your computer is called
a) Buffer
b) Bugs
c) Emulation
d) Noise

20. The term used to describe the process of moving information from memory or buffer to a diskette or printer is callled
a) Download
b) Dump
c) LogOff
d) Upload

Appendix B

APPENDIX B

Technology Teacher Survey
Question Data

1. What grade level(s) do you presently work with?
   - A. Elementary School
   - B. Middle School
   - C. High School
   - D. Community College
   - E. College or University
   - F. Graduate Level

2. What time period best describes how long your class spends on telecommunications?
   - A. None - we don't study it at this time.
   - B. 1 to 5 days
   - C. 1 to 2 weeks
   - D. 2 to 3 weeks
   - E. 4 weeks
   - F. 9 weeks
   - G. a semester

3. How many computers do you have in your classroom available for student use?
   - A. 1
   - B. 2 to 5
   - C. 6 to 10
   - D. 11 to 15
   - E. 16 to 20
   - F. 20 +

4. Do you have a modem in you classroom?
   - A. Yes
   - B. No

5. Do you have a BBS set up in your classroom for the purpose of teaching telecommunications?
   - A. Yes
   - B. No

6. Do you have a dedicated phone line in your classroom?
   A. Yes
   B. No

7. How many students do you average per class?
   A. 1 to 5
   B. 6 to 10
   C. 10 to 15
   D. 15 to 20
   E. 20 to 25
   F. 25 +

8. About how many students are able to access the communications software at one time?
   A. None - we have no access
   B. Only 1 at a time
   C. 2 to 3
   D. 4 to 5
   E. 6 or more
   F. All of the students because we are networked with the modem

9 Are you presently using a text, program or any other material specifically designed for the purpose of teaching telecommunications?
   A. Yes
   B. No

10. If you answered yes to question #9, is the text, program or material you use available to other teachers of technology?
   A. Yes
   B. No
   C. No - I created the material myself and haven't published it yet.
   D. Not applicable - I answered No to #9

11. Do you teach telecommunications as a unit in an applications or programming class?
   A. Yes
   B. No

12. Does your district or state have a set of curriculum objectives for the teaching of telecommunications?
    A. Yes
    B. No - not that I'm aware of

13. When you teach the unit on telecommunications, do you find that the students who are not online are often not on task?
    A. Yes
    B. No
    C. Not applicable

14. What other types of activities do you have the students work on when they are not online?
    A. Subject related worksheets
    B. Subject related puzzles
    C. Computer Games
    D. Anything to keep them busy.
    E. Not applicable - they are all online at the same time.

15. Do you find a significant difference in the achievement level of those students who have a computer and modem at home and those who do not?
    A. Yes, students who have computers at home usually perform much better.
    B. No, no significant difference.
    C. Not applicable in my situation.

16. If you had a BBS simulator that provided practice in the basic skills of accessing a BBS, sending electronic mail and reading a BBS menu, do you feel your students would find telecommunications more relevant?
    A. Yes
    B. No
    C. It wouldn't make sense in my particular situation.

Appendix C

STUDENT PROGRESSION REPORT
TELECOMMUNICATIONS

ACTIVITY	NAME OF BOARD, SYSOP, SUB-BOARDS, E-MAIL TO/FROM and FILE NAMES U/L and D/L GO HERE	DATE
One Registration:	_____	_____
Two E-Mail Sysop:	_____	_____
Three Join Sub-Board:	_____	_____
Four Post Introduction:	_____	_____
Five Sent E-Mail To:	_____	_____
Six Received E-Mail From:	_____	_____
Seven Check Calllog/User Name:	_____	_____
Eight Uploaded File:	_____	_____
Nine Downloaded File:	_____	_____
Ten Hard-Copy of D/L:	_____	_____

**********TEACHER SECTION

Verification of Activities:

Activity	Initials	Earned	Possible
1)Registration	____	___	10
2)E-Mail to Sysop	____	___	10
3)Sub-Board	____	___	10
4)Post Intro	____	___	10
5)Send E-Mail	____	___	10
6)Receive E-mail	____	___	10
7)Calllog/User Name	____	___	10
8)Upload File	____	___	10
9)Download File	____	___	10
10)Hard-Copy of D/L	____	___	10
			**********
		TOTAL GRADE:___	100

Date of Component Completion _____

Appendix D

E-MAIL ACTIVITY #5

SELF ASSESSMENT

DIRECTIONS: This will be your final E-Mail assignment in this class. You will send this E-Mail message to the Sysop and it will be reviewed for consideration as part of your final grade. The content of this message will be your own assessment of how much you actually learned in this telecommunications course, what you liked best about the course, what you liked least about the course and whether you think you will ever use telecommunications in your future (explain why or why not).

Dear Sysop,

Some of the things I have learned in the past nine weeks are:
(In the following paragraph I would like for you to tell me some of the things you learned in this nine weeks. Please be specific.)

The things I liked most about telecommunications were:
(Describe the activities that you enjoyed most in this class, if any, and explain why you liked these particular activities.)

Some of the things I least liked about this class were:
(In this paragraph I would like you to tell me about the things you found most frustrating in this class. Can you recommend ways to make this situation(s) better?)

I feel I will be using telecommunications a great deal in my future because....OR
I don't feel I will ever have use for telecommunications in my future because...(Choose one statement - explain)
Finally, I feel I deserve a(n)____ in this class because:
(Tell me specifically why you think you deserve this grade.)

Your Student,

(Type your First and Last Name)
Period _____

Appendix E

APPENDIX E

Documentation

This program was written for instructional purposes to introduce the concept of telecommunications to novice users. The program will run on all types of PC-compatible computers but it works best on a 286 or above.

The program disk should contain the following files: Simbbs.exe, change.exe,bull1,bull2,bull3,bullaid.hlp,connect.hlp,downaid.hlp,edit.hlp, educate.hlp, filehelp.hlp, logon.hlp, mail.hlp, mainhelp.hlp, register.hlp, upaid.hlp and user.hlp. These files must be present in order for SimBBS to run correctly. The files with the extension .hlp are text files written as instructional aids in the program. These files 'pop-up' at places in the program where decision making problems were anticipated by the writer. An option to view these files is presented at the opening screen. The viewer may select to turn the files on or off at that point. It is recommended that any instructor wishing to implement this program in the classroom view the help files at least once before introducing the program to the class.

To run Simbbs insert the program disk into drive A (or drive B depending on which drive accepts a 3½" disk.) Then type in Simbbs at the prompt. A:>SIMBBS , this will execute the program.

The opening screen welcomes the user and instructs the user to press ENTER to begin. There is a option in the second screen which allows the user to turn the pop-up, help files on or off. If the user is a novice it is recommended that the yes option be selected. The first help screen will then "pop-up"with instructions. These instructions inform the user that it will be necessary to read through the help files before making decisions in the program. If the user is already familiar with the BBS concept, select NO and then ENTER to continue.

The next screen asks the user to select the graphics mode desired. Although there is a help file for this decision it is purely instructional because there is actually no decision being made at this time. Any key pressed will automatically take the user to the login prompt.

The logon prompt instructs the user to type in their name or NEW. A first time user will need to type in NEW and then press ENTER. The program will then switch to the registration menu. After completing the registration menu the user will need to press ENTER and the program will record that information and switch to the bulletins screen. At this point, the user is asked to choose a bulletin to read or press ENTER to continue to the main menu.

If the user has previously logged onto SimBBS, the name will be

recognized and the user will be prompted for a password. After typing in the password, a count of the user's logins will be displayed with the number of messages the user has sent. If the password is not recognized the program will display a message that says "Sorry, invalid password. Try again later." The program will then terminate and the user will be back at the A> or C> prompt.

After a successful logon the user will be able to select activities from the Main Menu. Some of these selections are for the purpose of creating a more realistic feel to the program only. For example, the doors section will switch to a screen that allows the user to select a door but there is really no program available in that door. A message is displayed informing the user that this portion of SimBBS is still under construction. Another simulated area is the User list. This brings up a text file with names and locations of persons who have used the BBS. The user can view this list of names but it is only a simulation of what the user would see on a real BBS.

The other areas of the main program will work for the user. An electronic mail message can be written and saved by using the Email section. If the user chooses E for email, the program will switch to the text editor. Instructional screens will guide the user through this section. An actual message can be written in the text editor and saved by using the period key to enter the first and only character on a line. The message will then be saved.

This message can be viewed by the person it has been addressed to when that person logs onto SimBBS. A program called changer.pas was written to allow any messages composed in the text editor to be saved as an ASCII file. To convert the file from email to ASCII the user needs to type in CHANGE at the prompt and then the file name without the extension. Changer.pas will convert the present text file to ASCII and it can then be copied or uploaded to a real BBS.

The sub-boards section works much the same way as the email section. If the user wishes to view a list of the sub-boards then the selection to make would be L for list Sub-boards. A screen with a listing of the sub-boards will then be displayed. By selecting P for post the user may post a message to a sub-board for all or specify a user to send the message to. By selecting P for post the user will be prompted to enter the letter of the sub-board they wish to post to. After making this selection the program will switch to the text editor and the user can type in the message at that point.

To read messages in the sub-board the user will need to select R for read and then select the letter of the designated sub-board. A message will be displayed if there are no messages to be found in that sub-board, otherwise any messages left will be displayed for the user to view. The user has the option of deleting these messages or saving them.

Scan is a procedure to scan all of the sub-board for messages and display any that are found. To select scan the user simply presses S for scan. If there are no messages found the user will be informed of this and returned to the main menu.

The files section contains a simulation of the files menu on an actual BBS. When F is selected from the Main Menu a message informing the user that the program is switching to the files section will be displayed. Once in the files area the user may select to do several things. A help file is provided in this section to help those who are unfamiliar with what the file transfer process involves. By selecting H for help, the help file will pop-up with additional instructions.

Selecting L in this section will bring up a listing of the different file directories available on SimBBS. The user can actually switch to these file directories by typing the name of the directory at the prompt. Actually, the user only needs to type in the first two letter of the directory name and the program will pick up the name. The program will then switch to the directory selected and a list of files in that directory will be displayed.

At this point in the program the writer decided to make a few procedures automatic. For instance, the prompt to type in a file name for downloading comes up automatically. The user must then type in the name of

the file they wish to download. The program will display this name again and then prompt the user to select a protocol. Once the protocol has been selected the user is asked if an automatic log-off is desired after the download. This is actually just to illustrate what happens during the downloading process on some systems. Any key pressed at that time will return the user back to the Files Menu.

If the user wishes to upload a file the screen prompts for the name of the file to upload. Once again it was decided to make several procedures automatic at this point. That includes selecting the protocol and a message advising the user to escape back to the local prompt to begin the file transfer.

Two options in this section will return the user to the main menu but were designed so that the user could not actually exit the program at this point. If G for goodbye or Q for quit are selected the user will be switched back to the main menu. However, G for goodbye in the main menu must be selected in order to quit the program completely and go back to the main prompt.

Pseudocode

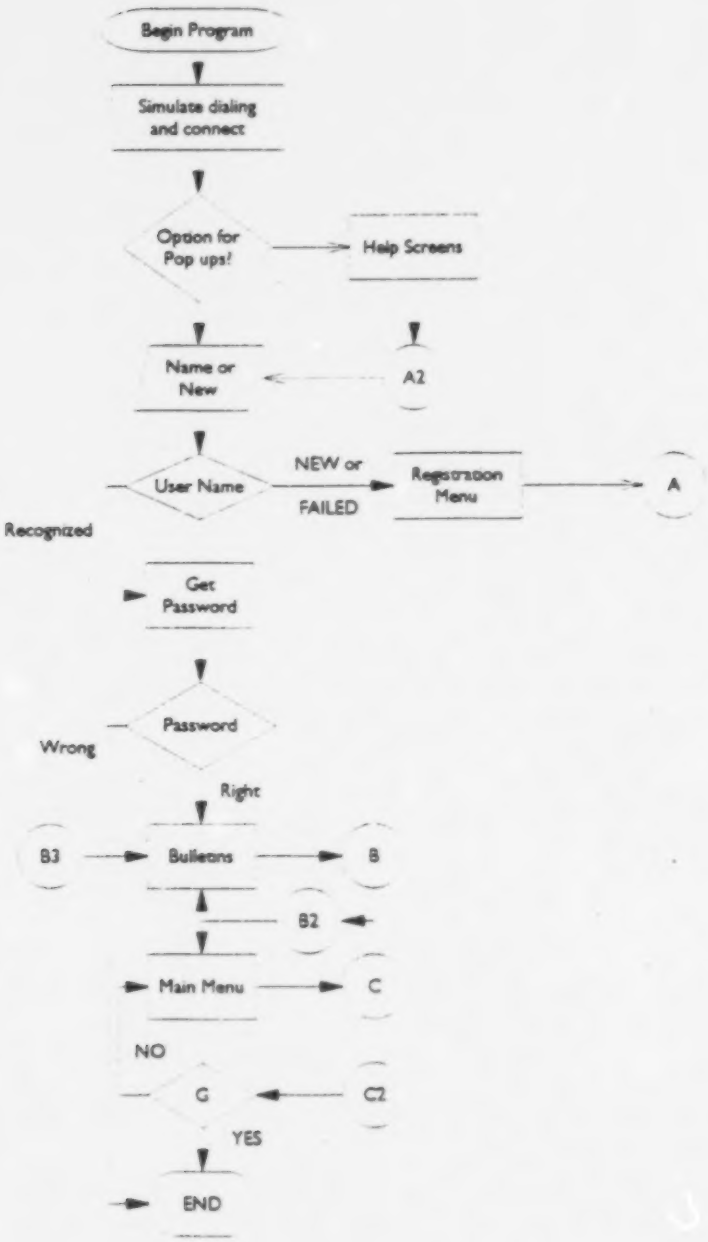
```
Welcome screen and directions
Enter to continue
Simulate dialing and connection at 2400 baud
Pop-Up menu option. Choose Yes or No
Select graphics mode <C>olor, <M>onochrome,<N>one
Enter name or New
If NEW then - New User Menu
                Registration Menu
                Input User data

Else if User name recognized the
                check password
If password is true then
                display number of times called and
                number of messages sent
else if password is false display
                sorry, wrong password, try again later
Go to bulletins
        Option to read bulletins 1,2 or 3 or Enter to continue
Go to Main Menu Section
<B>ulletin Section - go back to the bulletin options
<D>oor section gives list of available doors .
        Choice of which door to view
        Display message that this section is still under construction
<E>lectronic Mail
        Option are to <S>end mail, <R>ead mail, or <Q>uit to main menu
        If  <S> then go to editor screen
                Display instructions for editor
                        Enter a period as the first and only character of a line for
                        menu
                Display Send message to:
                Display From:
                Display Subject:
                Type in user data.
                Select <A>bort message,<C>hange line or <S>ave
```

If A then message is deleted
If C then begin altermess instructions
Select <L>ist lines, <E>nter line number to change or <D>one.
If choice is L then list lines of message
Option to show more
Choice Yes or No
If choice is E then display sentence "Enter line number to change:"
Display "Are you sure you want to change this line?"
Option Yes or No
Display Enter New Line:
User input new line
Display Your newline is [display new line]
Option to accept change Yes or No
If choice is D then user is finished.
Return back to Main Menu
If <R> then check for user mail and display message
Sorry no mail today if there is empty email data
Display message from editor if Email is waiting
Option to Delete email or save it
Return back to main menu
<F>ile sytem choice go to Files menu
If <L>ist of directories then display the directories available
Display the line "Enter the Directory or <Q> for Quit
User inputs name of directory
Display the line "Switching to [name of directory]. Please wait.
clearscreen and display directory with files listed
Display the line "Enter the file you wish to download."
User inputs file name
Display the line Selected file [insert name of file]
Display list of protocols X,Y,Z and Kermit
Display the line "Select the Protocol for your file transfer
Display the line "Auto log off after download?"
Options <Y>es,<N>o,<Q>uit
Readkey and switch back to the files menu
If Download then display line "Enter the file you wish to download."
Display Protocols and options as in previous selection
If <G>oodbye then return to Main Menu

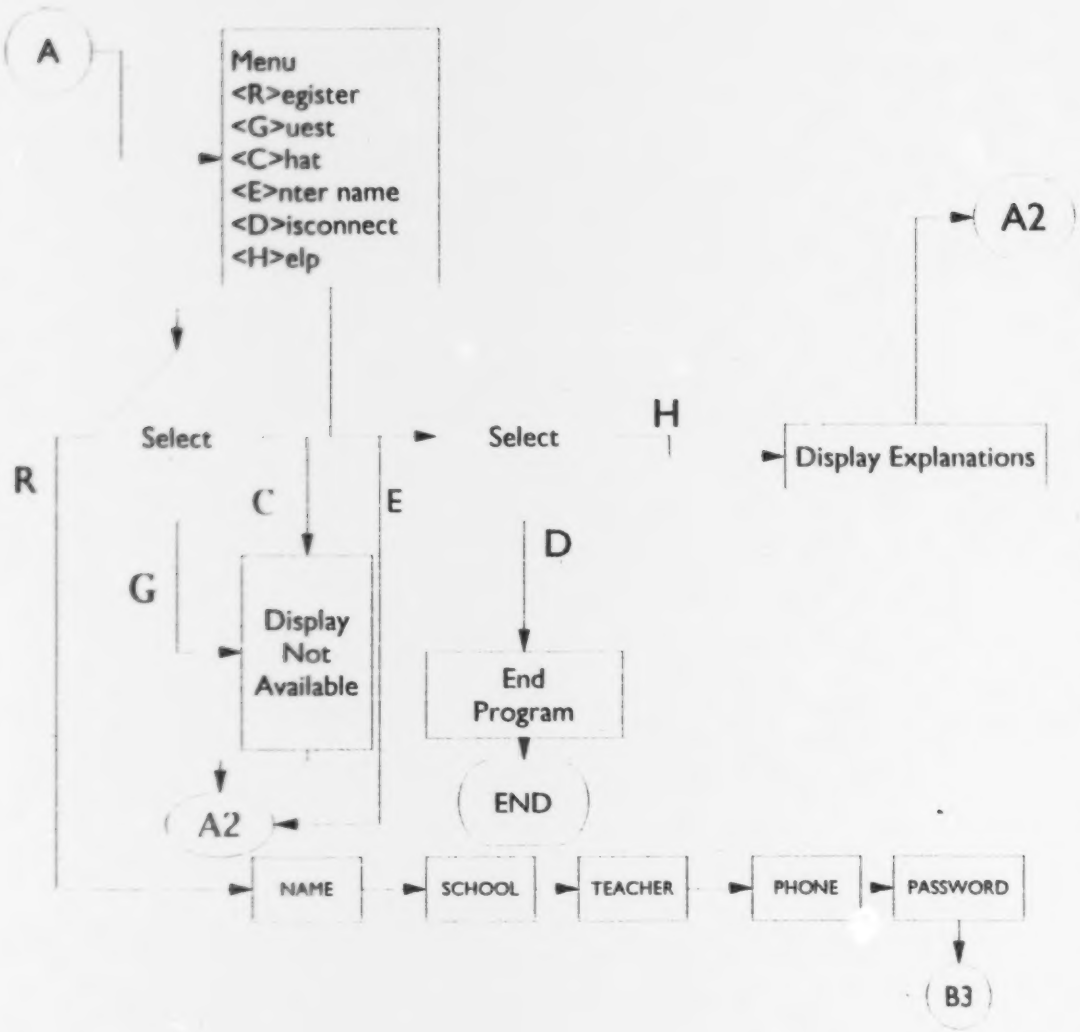
If <Q>uit then return to Main Menu
If <U>pload then
    Display line "Enter the filename you wish to upload."
    Display file [name of file user typed in]
    Display list of protocols to choose from
    Display the line "Select the protocol for your file transfer>"
    Display the line "Escape back to your local prompt to begin
    Zmodem transfer."
If <X>proto is selected then
    Display the protocols X,Y,Z and Kermit
    Display the line "Select the protocol for your file transfer>"
    Readkey and return back to the Files Menu
If <G> or <Q> return back to Main Menu

If <H>elp is selected then display the text file for help in this section
    Enter to return to Main Menu
If <L>ist is selected then display the list of sub-boards available to join
    Enter letter <L>ist, or <Q>uit
        If L then display the list of sub-boards again
        If Q then quit and return back to main menu
        If A,B,C,D,E then begin procedure editor
If <S> then display line "Which sub-board? Enter letter, <L>ist
    If message in sub-board then display information about the message
    Information displayed is To: [name of person(s) receiving message]
                From:[name of user]
                Subject: what the message is about
    Display the line "Press a key to return to the main menu
If <T>oggle switch is selected do one of the following:
    If help menu option is turned off then turn it on
    If help menu option is turned on then turn it off
If <U>ser information is selected then display the text file with user names

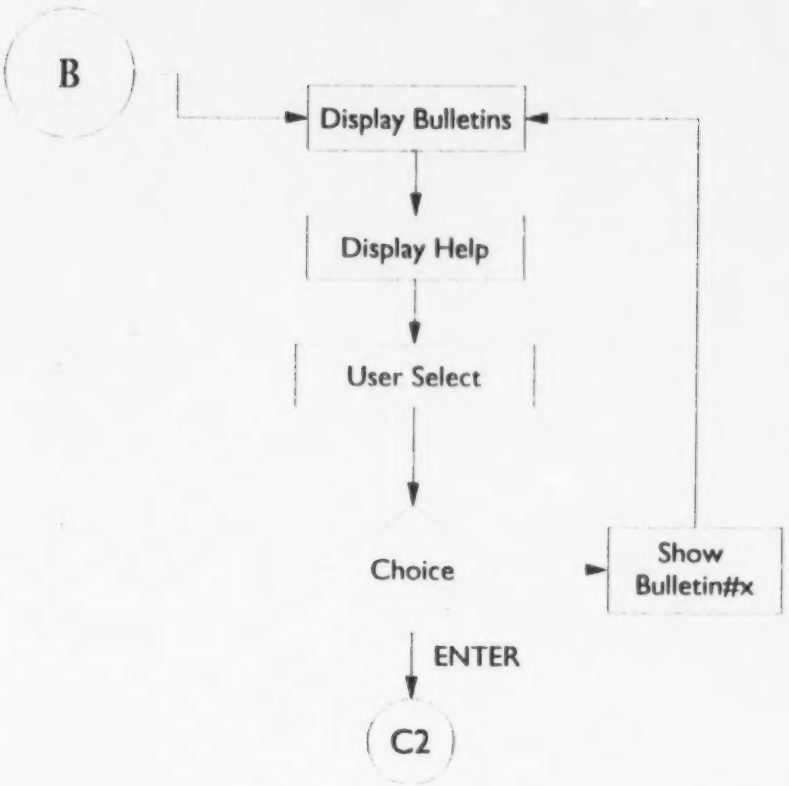
Flowchart
for
Main Program



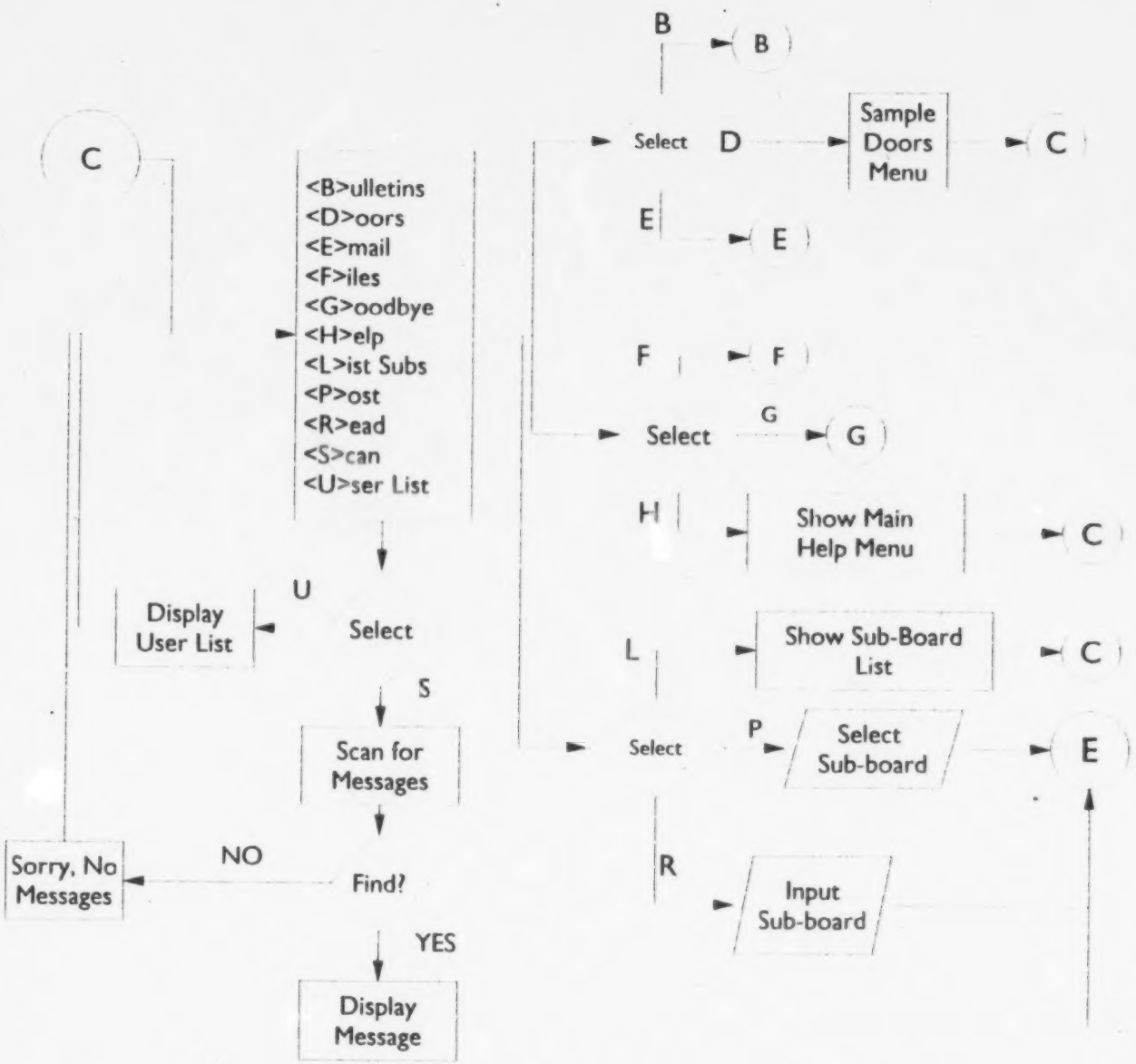
Registration
Menu

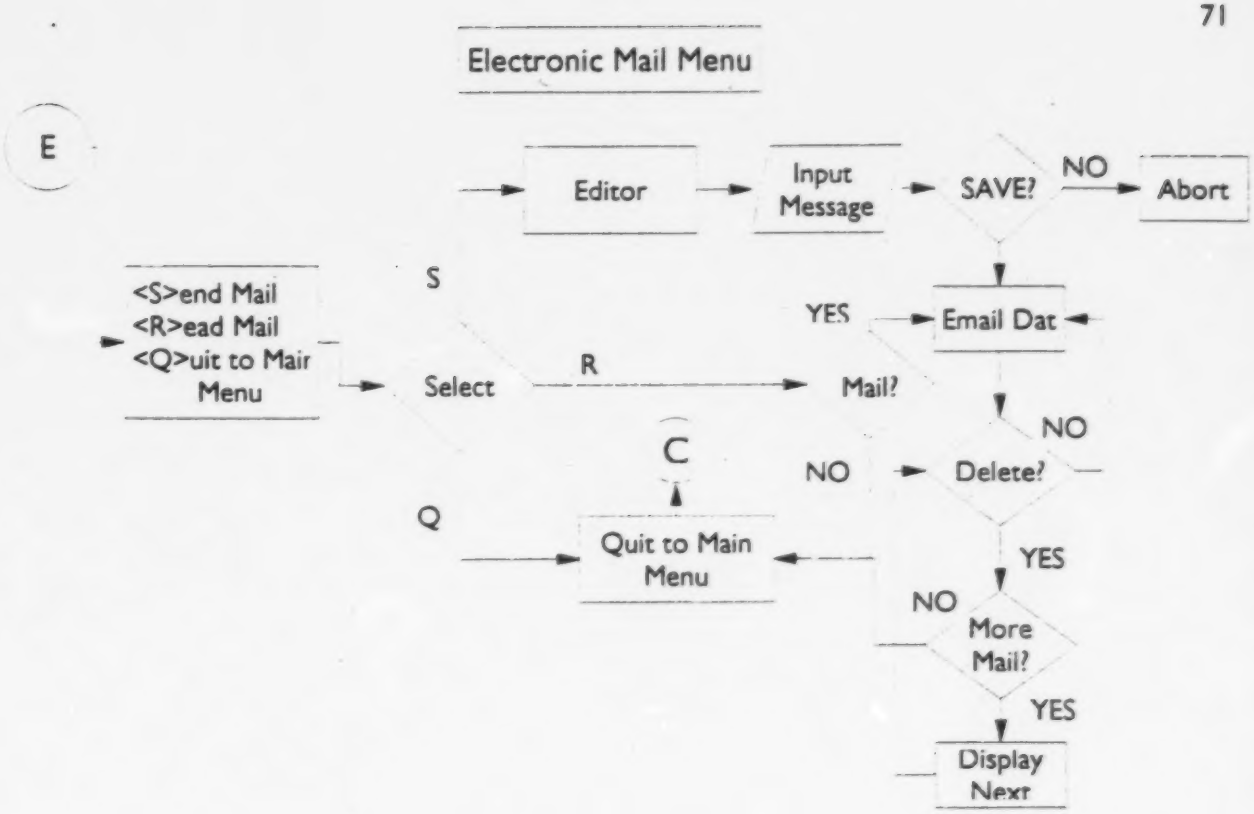


Bulletins Menu

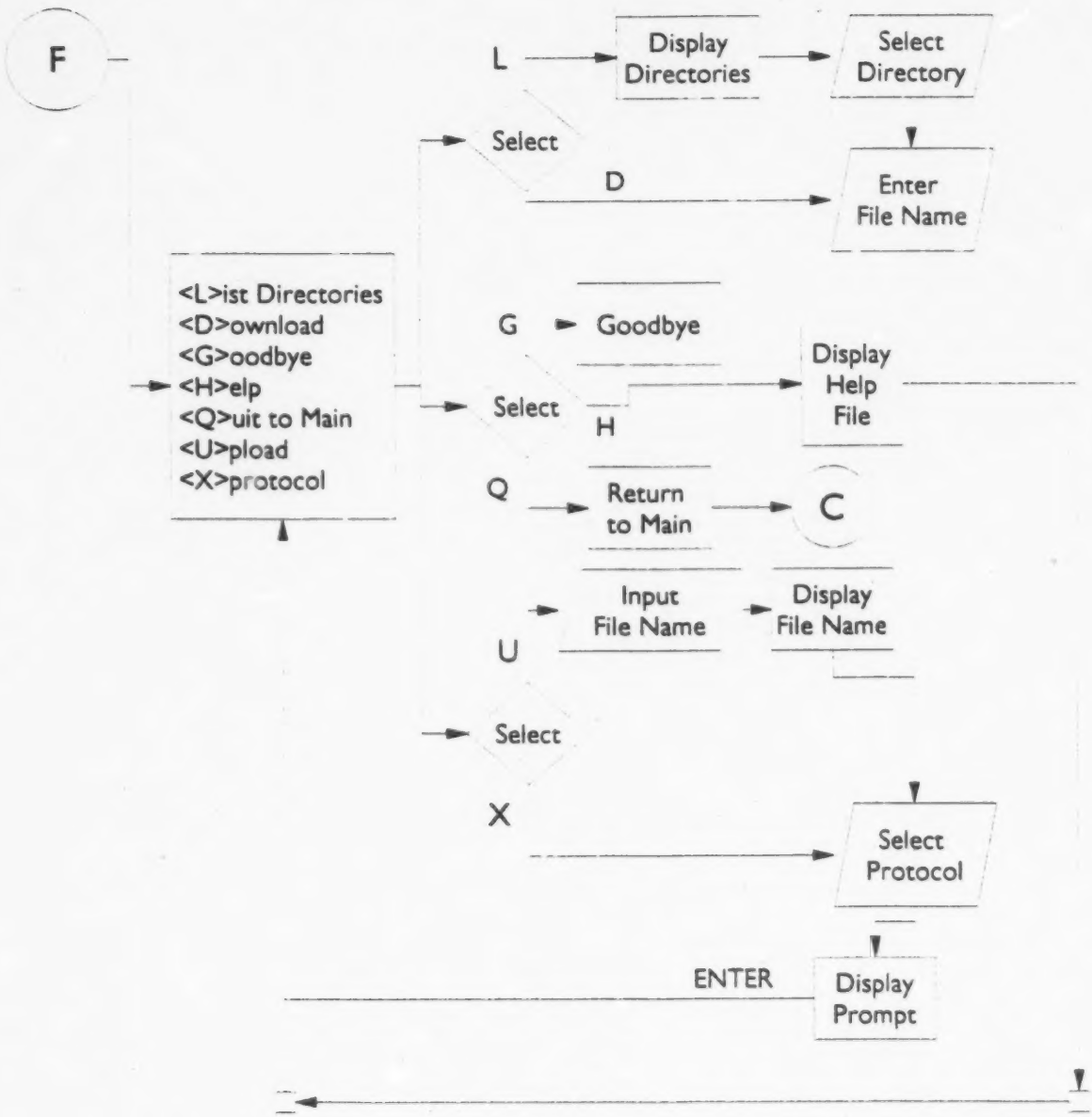


Main Menu


C
<B>ulletins
<D>oors
<E>mail
<F>iles
<G>oodbye
<H>elp
<L>ist Subs
<P>ost
<R>ead
<S>can
<U>ser List
U
Display User List
Select
S
Scan for Messages
NO
Find?
Sorry, No Messages
YES
Display Message
B
B
Select
D
Sample Doors Menu
C
E
E
F
F
Select
G
G
H
Show Main Help Menu
C
L
Show Sub-Board List
C
Select
P
Select Sub-board
E
R
Input Sub-board


Electronic Mail Menu
E
Editor
Input Message
SAVE?
NO
Abort
<S>end Mail
<R>ead Mail
<Q>uit to Mair Menu
Select
S
R
C
Q
YES
Email Dat
Mail?
NO
Delete?
NO
YES
Quit to Main Menu
NO
More Mail?
YES
Display Next

Files Menu


F
L
Display Directories
Select Directory
Select
D
Enter File Name
<L>ist Directories
<D>ownload
<G>oodbye
<H>elp
<Q>uit to Main
<U>pload
<X>protocol
G
Goodbye
Select
H
Display Help File
Q
Return to Main
C
U
Input File Name
Display File Name
Select
X
Select Protocol
ENTER
Display Prompt

```
program simulator;
uses dos,crt;
type
   st12       =      string[12];
   st70       =      string[70];
   st20       =      string[20];
   st10       =      string[10];
   date= record
        m,d,y :       word;
          end;
          who = record
              name    :      st20;
              pass    :      st10;
              school  :      st20;
              teach   :      st20;
              phone   :      st20;
              laston  :      date;
              calls   :      word;
              mess    :      word;
          end;
          userfile    =      file of who;
          messarray   =      array[1..50] of st70;
          messtype    =      record
                     flag   :    boolean;
                     mes    :    messarray;
          end;
          messfile    =  file of messtype;
       var
          user        :      who;
          gmore       :      char;
          uf          :      userfile;
          pos         :      word;
          cont        :      boolean;
          hlp         :      text;  {message textfile variable}
          mess        :      messarray;
          messrec     :      messtype;
          m           :      messfile;
          vuaid       :      boolean;
       procedure putnewinfo;
```

```
begin
    reset(uf);
    seek(uf,pos);
    write(uf,user);
end;
procedure toggle;
begin
    if vuaid=true then
       vuaid:=false
    else
        vuaid:=true;
end;
procedure aid(fyle:st12;x1,y1,x2,y2,fg,bg:integer);
var
  lin          : integer;
  count        : integer;
  s            : st70;
  ach          : char;
begin
    textcolor(fg);
    textbackground(bg);
    window(x1,y1,x2,y2);
    lin:=y2-y1;
    count:=0;
    clrscr;
    assign(hlp,fyle);
    reset(hlp);
    while not eof(hlp) do
        begin
            readln(hlp,s);
            writeln(s);
            count:=count+1;
            if count mod lin = 0 then
               ach:=readkey;
        end;
    close(hlp);
    textbackground(0);
    window(1,1,80,25);
end;
```

```
procedure login;
var
   d            :       integer;
   ch           :       char;
   choice       :       char;
   dflag        :       boolean;
begin
     textcolor(15);
     textbackground(1);
     clrscr;
     vuaid:=false;
     for d:=1 to 5 do
         writeln;
     writeln('                    Welcome to the BBS Simulator.');
     writeln('              Press ENTER when you are ready to begin.');
     writeln;
     writeln('              Produced as a Practicum Project for Nova University');
     writeln('                                        by Catherine A. Brett');
     writeln('                                              June 1993');
     ch:=' ';
     while ord(ch)<>13 do
          ch:=readkey;
     clrscr;
     writeln('Dialing:   Local System BBS');
     writeln('ATDT 462-7388');
     delay(2000);
     writeln('Connect 2400');
     write('If you wish to view the pop-up help menus press Y, if not press N.
');
               repeat
                    choice:=readkey;
                    choice:=upcase(choice);
               until choice in ['Y','N'];
               if choice='Y' then begin
                  vuaid:=true;
                  if vuaid then aid('connect.hlp',20,5,60,20,7,0);
                  delay(2000);
               end;
               if choice='N' then begin
```

```
            vuaid:=false;
            end;
    clrscr;
end;
procedure listbull;
var
    ch   :  char;
    more :  boolean;
begin
    ch:=' ';
    more:=true;
    while more do
        begin
        textcolor(14);
        textbackground(0);
        clrscr;
        writeln('                                                    BULLETIN');
        writeln;
        textcolor(14);
        textbackground(0);
        writeln('Press [Ctrl-s] to Pause, [Spacebar] or [Ctrl-c] to Abort');
        writeln;
        textcolor(15);
        textbackground(0);
        writeln('Simulator Board Bulletins:');
        writeln('3.   4-25-93   Nobody Reads These Anyhow');
        writeln('2.   4-24-93   This is Just to Get the Feel');
        writeln('1.   4-1-93    When in Doubt Just Press ENTER');
        writeln;
        write('Read Bulletin [1-3] (Enter to Continue):');
                if vuaid then aid('bullaid.hlp',40,15,80,25,0,7);
                repeat
                ch:=readkey;
                until (ch in ['1','2','3']) or (ord(ch)=13);
                if ord(ch)=13 then
                more:=false;
                case ch of
                '1':assign(hlp,'bull1');
                '2':assign(hlp,'bull2');
```

```
                    '3':assign(hlp,'bull3');
                end;
                    if ord(ch)<>13 then
                    begin
                        textcolor(15);
                        textbackground(0);
                        clrscr;
                        reset(hlp);
                         while not eof(hlp) do
                              begin
                                  read(hlp,ch);
                                  write(ch);
                                  end;
                                  write('Press Enter to Continue...');
                                  ch:=readkey;
                              end;
                         end;
                    end;
procedure title;
var
   i   : integer;
   d   : char;
begin
     textcolor(7);
     textbackground(0);
     clrscr;
     for i := 1 to 5 do
     writeln;
     writeln('       TELECOMMUNICATIONS SKILLS ASSESSMENT TEST
');
     writeln;
     writeln('      This section of SIM-BBS still under construction ');
     writeln;
     d :=readkey;
end;

procedure doors;
var
   d : char;
```

```
begin
     textcolor(14);
     textbackground(1);
     clrscr;
     writeln('You have just entered the DOORS section of the BBS');
     writeln;
     writeln('The following is a list of the DOORS available to you');
     writeln;
     writeln('<1> Telecommunications Skills Assessment');
     write('Select the door you wish to enter:  ');
          repeat
              d:=readkey;
              d:=upcase(d);
          until d in ['1'];
          case d of
               '1': title;
          end;
       end;
procedure listconf;
var
  dummy          : char;
     c           : integer;
begin
     textcolor(14);
     textbackground(1);
     clrscr;
     for c:= 1 to 5 do
     writeln;
     writeln('This is a list of the Sub-boards or Conferences available on
SimBBS');
     writeln('   A.  General Discussion');
     writeln('   B.  Middle School Madness');
     writeln('   C.  Foods');
     writeln('   D.  Sports');
     writeln('   E.  Se Habla Espanol');
     writeln;
     writeln('Press a key to return to menu...');
    dummy:=readkey;
 clrscr;
```

```
end;

procedure editor;

var
   j,ch          : char;
   command       : char;
   line          : st70;
   werd          : string[35];
   message       : messarray;
   lin           : integer;
   chn           : integer;

procedure editmess;
var
   t2,fr,j    : st20;
   t,mark     : integer;
   a,b,c      : integer;
begin
     clrscr;
     if vuaid then aid('edit.hlp',40,2,80,18,0,7);
     textcolor(14);
     clrscr;
     writeln('Enter a period as the first and only character of a line for menu.');
     writeln('-------------------------------------------------------------------------------');
     write('Message To:  ');
     read(t2);
     for t:=1 to length(t2) do
         t2[t]:=upcase(t2[t]);
     for t:=1 to 50 do
         message[t]:='';
     gotoxy(14,3);
     writeln(t2);
     writeln('From       : ',user.name);
     write('Subject    : ');
     readln;
     readln(message[3]);
     writeln('-------------------------------------------------------------------------------');
     lin:=3;
```

```
message[1]:=t2;
message[2]:=user.name;
t:=0;
while (lin<50) do
      begin
          lin:=lin+1;
          write(message[lin]);
          repeat
               if ord(ch)<>8 then
                  t:=t+1;
               ch:=readkey;
               if ord(ch)=0 then
                  begin
                       if keypressed then ch:=readkey;
                       t:=t-1;
                  end
               else
                   if ord(ch)=8 then
                   begin

message[lin]:=copy(message[lin],1,length(message[lin])-1);
                       t:=t-1;
                       gotoxy(1,lin+3);
                       write(message[lin]);
                       write(' ');
                       gotoxy(t,lin+3);
                  end
               else
                   begin
                        message[lin]:=message[lin]+ch;
                        write(ch);
                    end;
          until ((t=1) and (ch='.')) or (t>70) or (ord(ch)=13);
          mark:=lin;
          if message[lin]='.' then
             lin:=51;
          if t>70 then
             begin
                 chn:=t+1;
```

```
                repeat
                        chn:=chn-1;
                until message[lin,chn]=' ';
                if chn<t then
                   begin
                        for a:=chn+1 to 70 do
                           begin
                              if a<71 then

message[lin+1]:=message[lin+1]+message[lin,a];
                                 message[lin,a]:=' ';
                                 gotoxy(a,lin+3);
                                 write(' ');
                           end;
                        gotoxy(71,lin+3);
                        write(' ');
                        message[lin+1]:=message[lin+1]+ch
                   end;
             end;
             t:=length(message[lin+1]);
             writeln;
          if (t>70) or (ord(ch)=13) then writeln;
       end;
    message[mark+1]:='###';
end;

procedure altermess;
var
  choose      : char;
  page        : word;
  lin         : word;
  newline     : st70;
begin
    choose:='#';
    repeat
       clrscr;
       writeln(message[1]);
       writeln(message[2]);
       writeln(message[3]);
```

```
writeln;
writeln('<L>ist lines, <E>nter line number to change, <D>one');
writeln;
repeat
      choose:=readkey;
      choose:=upcase(choose);
until choose in ['L','E','D'];
page:=4;
case choose of
    'L' :  begin
                while page < 26 do
                     begin
                          writeln(message[page]);
                          page:=page+1;
                     end;
                writeln('Show more?  Y/N');
                repeat
                     choose:=readkey;
                     choose:=upcase(choose);
                until choose in ['Y','N'];
                if choose='Y' then
                   while page<51 do
                        begin
                             writeln(message[page]);
                             page:=page+1;
                        end;
           end;

    'E' :  begin
                write('Enter line number to change:  ');
                readln(lin);
                writeln(message[lin]);
                writeln;
                writeln('Are you sure you want to change this line?
Y/N');
                repeat
                     choose:=readkey;
                     choose:=upcase(choose);
                until choose in ['Y','N'];
```

```
                    if choose='Y' then
                      begin
                          writeln;
                          writeln('Enter new line:');
                          readln(newline);
                          writeln;
                          writeln('Your newline is:');
                          writeln;
                          writeln(newline);
                          writeln('Accept change?  Y/N');
                          repeat
                              choose:=readkey;
                              choose:=upcase(choose);
                          until choose in ['Y','N'];
                          if choose='Y' then
                            message[lin]:=newline;
                      end;

                end;
          end;
    until choose='D';
end;

begin
    textcolor(3);
    textbackground(0);
    clrscr;
    line:='';
    werd:='';
    lin:=0;
    chn:=0;
    command:='#';
    ch:='#';
    editmess;
    command:='#';
    writeln;
    while not (command in ['A','S']) do
    begin
        writeln('<A>bort the message, <C>hange a line, <S>ave it');
```

```
        repeat
            command:=readkey;
            command:=upcase(command);
        until command in ['A','C','S'];
        if command='C' then
          altermess;
    end;
    if command = 'S' then
      begin
          user.mess:=user.mess+1;
          putnewinfo;
    {$I-}
        reset(m);
    {$I+}
        if ioresult<>0 then
          rewrite(m)
        else
          begin
              reset(m);
              while not eof(m) do
                  read(m,messrec);
          end;
        mess:=message;
        messrec.mes:=mess;
        messrec.flag:=true;
        write(m,messrec);
          close(m);
      end;
end;
procedure post;
var
  conf          : char;
  conftopic     : string[12];
begin
    textcolor(15);
    textbackground(1);
    clrscr;
    repeat
        writeln('Which Sub-board?  Enter Letter, <L>ist or <Q>uit:  ');
```

```
            repeat
                 readln(conf);
                 conf:=upcase(conf);
            until conf in ['A','B','C','D','E','L','Q'];
            case conf of
                'A':conftopic:='General Discussion';
                'B':conftopic:='Middle School Madness';
                'C':conftopic:='Foods';
                'D':conftopic:='Sports';
                'E':conftopic:='Se Habla Espanol';
                'L':listconf;
            end;
        until conf in ['A','B','C','D','E','Q'];
            case conf of
                'A':assign(m,'General.dat');
                'B':assign(m,'Middle.dat');
                'C':assign(m,'Foods.dat');
                'D':assign(m,'Sports.dat');
                'E':assign(m,'Espanol.dat');
            end;
        if conf<> 'Q' then editor;
end;
procedure readin;

var
   c              : char;
   lin            : integer;
   sentence       : st70;
begin
    {$I-}
        reset(m);
    {$I+}
    if ioresult<>0 then
      begin
          writeln('Sorry, no messages in that subboard.');
          delay(3000);
      end
    else
       begin
```

```
                {message read system}
                reset(m);
                while not eof(m) do
                     begin
                          read(m,messrec);
                          lin:=0;
                          while (lin<50) and (messrec.mes[lin]<>'###') do
                               begin
                                    lin:=lin+1;
                                    case lin of
                                         1:write('TO   :  ');
                                         2:write('FROM:  ');
                                         3:write('Subj:  ');
                                    end;
                                    writeln(messrec.mes[lin]);
                                    if lin=3 then
                                       writeln;
                                    if lin mod 22 = 0 then
                                       begin
                                            write('<more>');
                                            c:=readkey;
                                            writeln;
                                       end;
                               end;
                          writeln('Press key for next message...');
                          c:=readkey;
                          clrscr;
                     end;
                end;
end;

procedure reed;
var
   conf          : char;
   conftopic     : string[12];
   lin           : integer;
   sentence      : st70;
begin
    textcolor(15);
```

```
    textbackground(1);
    clrscr;
    repeat
        writeln('Which Sub-board?  Enter Letter, <L>ist or <Q>uit:  ');
        repeat
            readln(conf);
            conf:=upcase(conf);
        until conf in ['A','B','C','D','E','L','Q'];
        case conf of
            'A':conftopic:='General Discussion';
            'B':conftopic:='Middle School Madness';
            'C':conftopic:='Foods';
            'D':conftopic:='Sports';
            'E':conftopic:='Se Habla Espanol';
            'L':listconf;
        end;
        until conf in ['A','B','C','D','E','Q'];
    case conf of
        'A':assign(m,'General.dat');
        'B':assign(m,'Middle.dat');
        'C':assign(m,'Foods.dat');
        'D':assign(m,'Sports.dat');
        'E':assign(m,'Espanol.dat');
       end;
    if conf<>'Q' then
      readin;
end;

procedure scan;
var
  conf          : char;
  conftopic     : string[12];
  lin           : integer;
  sentence      : st70;
begin
    textcolor(15);
    textbackground(1);
    clrscr;
    repeat
```

```
        writeln('Which Sub-board?  Enter Letter, <L>ist or <Q>uit:  ');
        repeat
            readln(conf);
            conf:=upcase(conf);
        until conf in ['A','B','C','D','E','L','Q'];
        case conf of
            'A':conftopic:='General Discussion';
            'B':conftopic:='Middle School Madness';
            'C':conftopic:='Foods';
            'D':conftopic:='Sports';
            'E':conftopic:='Se Habla Espanol';
            'L':listconf;
            'Q':aid('scan.hlp',40,15,75,25,7,0);
        end;
    until (conf<>'Q') and (conf<>'L');
    case conf of
        'A':assign(m,'General.dat');
        'B':assign(m,'Middle.dat');
        'C':assign(m,'Foods.dat');
        'D':assign(m,'Sports.dat');
        'E':assign(m,'Espanol.dat');
      end;
    lin:=0;
    if (conf<>'Q') and (conf <> 'L') then
      begin
          {$I-}
          reset(m);
          {$I+}
          if ioresult <> 0 then
            begin
                writeln('No messages to scan.');
                delay(5000);
            end
          else
              while not eof(m) do
                  begin
                      read(m,messrec);
                      writeln('TO:  ',messrec.mes[1]:15,'  FROM:
',messrec.mes[2]:15,'  ABOUT:  ',messrec.mes[3]:20);
```

```
                    lin:=lin+1;
                    if lin mod 22 = 0 then
                      begin
                          writeln('Press a key for more...');
                          conf:=readkey;
                      end;
                end;
            writeln('Press a key to return to menu...');
            conf:=readkey;
        end;
end;

procedure pack;
var
  mf            : messfile;
begin
    assign(mf,'temp.mes');
    rewrite(mf);
    reset(m);
    while not eof(m) do
        begin
            read(m,messrec);
            if messrec.flag=true then
              write(mf,messrec);
        end;
    close(m);
    close(mf);
    erase(m);
    rename(mf,'email.dat');
end;
procedure readit;
var
  rch           : char;
  t2            : st70;
  anything,dflag : boolean;
  lin,pos       : integer;
begin
    pos:=0;
    dflag:=false;
```

```
{$I-}
reset(m);
{$I+}
anything:=false;
if ioresult <> 0 then
begin
      clrscr;
      writeln('Sorry... no mail today.');
      writeln('Press a key to return to menu.');
      rch:=readkey;
  end
else
   begin
      clrscr;
      reset(m);
      while not eof(m) do
          begin
             lin:=1;
             read(m,messrec);
             if messrec.mes[1]=user.name then
                {reading mail}
                begin
                   anything:=true;
                   lin:=0;
                   while (lin<50) and (messrec.mes[lin]<>'###') do
                     begin
                       lin:=lin+1;
                       case lin of
                           1:write('TO   : ');
                           2:write('FROM:  ');
                           3:write('Subj:  ');
                       end;
                       writeln(messrec.mes[lin]);
                       if lin=3 then
                         writeln;
                       if lin mod 22 = 0 then
                         begin
                             write('<more>');
                             rch:=readkey;
```

```
                                writeln;
                            end;
                        end;
                        writeln('Delete this message?  Press Y or N');
                        rch:='$';
                        repeat
                            rch:=readkey;
                            rch:=upcase(rch);
                        until rch in ['Y','N'];
                        if rch='Y' then
                          . begin
                              messrec.flag:=false;
                              dflag:=true;
                              seek(m,pos);
                              write(m,messrec);
                            end;
                        writeln('Press key for next message...');
                        rch:=readkey;
                        clrscr;
                    end;
                    pos:=pos+1;
                end;
            end;
        if dflag then pack;
        if not anything then
          begin
            clrscr;
            writeln('Sorry... no mail today.');
            writeln('Maybe you should try writing to someone?');
            writeln('Press a key to return to menu.');
            rch:=readkey;
          end;
    end;
    procedure mail;
    var
      mch           : char;
    begin
        clrscr;
        mch:='!';
```

```
    assign(m,'Email.dat');
    clrscr;
    writeln('S to send mail');
    writeln('R to read mail');
    writeln('Q to quit and return to main menu');
    if vuaid then aid('mail.hlp',40,1,80,12,14,1);
    repeat
        mch:=readkey;
        mch:=upcase(mch);
    until mch in ['S','R','Q'];
    case mch of
        'S':editor;
        'R':readit;
    end;
end;

procedure xproto;
var
  z       : integer;
  d       : char;
begin
    textcolor(15);
    textbackground(0);
                    for z := 1 to 3 do
                    writeln;
                    writeln('<1>Xmodem');
                    writeln('<2>Ymodem');
                    writeln('<3>Kermit');
                    writeln('<4>Zmodem');
                    writeln;
                    write('Select the Protocol for your file transfer>');
                    readln(d);
    end;

procedure dl;
var
  fylename : string[12];
  l        : char;
  i        : integer;
```

```
begin
    textcolor(15);
        writeln;
        write('Enter the file you wish to download> ' );
        readln(fylename);
        for i := 1 to length(fylename) do
        fylename[i]:= upcase(fylename[i]);
        writeln(' Selected file ' ,  fylename);
        xproto;
        write('Auto Log off after download? <Y>es, <N>O, <Q>uit');
        repeat
            l := readkey;
            l:= upcase(L);
        until l in ['Y','N','Q'];
        writeln;
        writeln('Beginning Zmodem file transfer.');
        if vuaid then
          aid('downaid.hlp' ,40,20,80,25,0,7);
end;

procedure dumed;
var
  e      : char;
begin
    textcolor(15);
    textbackground(0);
    clrscr;
    writeln('                                        EDUCATIONAL
FILES');
    textcolor(11);
    writeln('Filename          Description                          # D/L');
    writeln('-------------------------------------------------------------------');
    writeln('Clang.zip         Teach yourself programming in C
3');
    writeln('Spanish1.zip      Teach yourself to speak Spanish
5');
    writeln('Guitar.zip        Teach yourself to play the guitar      105');
    dl;
  e:=readkey;
```

```
end;
procedure dumbbs;
var
  b      : char;
begin;
      textcolor(15);
      textbackground(0);
      clrscr;
            writeln('                                    BBS and
Telecommunication Files     ');
            textcolor(11);
            writeln('Filename          Description                    # of D/L');
            writeln('-------------------------------------------------------');
            writeln('TM310.zip         Telemate version 3.10              25');
            writeln('Telix.zip         Shareware communications software  5');
            writeln('Wildcat.zip       Program by Mustang software        3');
           dl;
    b:=readkey;
end;
procedure dumgame;
var
  f      : char;
begin;
  textcolor(15);
  textbackground(0);
  clrscr;
        writeln('                                          GAMES ');
        textcolor(11);
        writeln('Filename          Description                    # of D/L');
        writeln('-------------------------------------------------------');
        writeln('Aldo2.zip          DonkeyKong like game               25');
        writeln('Scorched.zip       Scorch the Earth                   30');
        writeln('727.zip            Flight Simulator game              12');
       dl;
  f:=readkey;
end;

procedure dummis;
var
```

```
  m     : char;
begin
    textcolor(15);
    textbackground(0);
    clrscr;
          writeln('
MISCELLANEOUS');
          textcolor(11);
          writeln('Filename                    Description                    # of
D/L ' );
          writeln('-------------------------------------------------------------------------' );
          writeln;
          writeln('Laptop.zip                  Test your laptop battery
5');
          writeln('Signs.zip                   Make Funny Car Signs
 8');
          writeln('VCRBase.zip                   Database for you Video Tapes
     3');
          dl;
          m:=readkey;
    end;
procedure dumup;
var
  u       : char;
begin
    textcolor(15);
    textbackground(0);
    clrscr;
          writeln('                                                    UPLOADS');
          textcolor(11);
          writeln;
          writeln('Filename              Description                    #
D/L');
          writeln('-------------------------------------------------------------------------');
          writeln('BGFormat.zip              Formats disk in the background
  5');
          writeln('Vocabp2.zip               Puzzle Generator
3 ');
          writeln('ScanV86B.zip              Virus Scanning Program
```

```
 9 ');
          dl;
          u:=readkey;
end;

procedure ul;
var
   fylename    :     string[12];
   I           :    integer;
   u           :     char;

begin
     textcolor(15);
     clrscr;
          write('  Enter the Filename you wish to Upload> ');
          readln(fylename);
          for i := 1 to length(fylename) do
          fylename[i]:=upcase(fylename[i]);
          writeln;
          writeln('Selected file ' ,  fylename );
          xproto;
          writeln('Escape back to your local prompt to begin Zmodem transfer');
          delay(2000);
          if vuaid then aid('upaid.hlp',35,15,80,25,0,7);
     u:=readkey;
end;
procedure listdir;
var
   d     :  integer;
   r     :  char;
   dlist :  string[12];
begin
     textcolor(14);
     textbackground(0);
     clrscr;
          writeln('Directories        Description              # of Files');

writeln('_____________________________________________________________');
          writeln('BBS                Communication Files          3 ');
```

```
            writeln('Educate          Educational Files          3 ');
            writeln('Games            Games for Download           3');
            writeln('Misc             Files that defy description  3');
            writeln('Uploads          Recently Uploaded Files      2');
            writeln;
            write('Enter the Directory or <Q> for Quit: ');
                  repeat
                        readln(r);
                        r:=upcase(r);
                  until r in ['B','E','G','M','U'];
                  case r of
                      'B':dlist:='BBS';
                      'E':dlist:='Educate';
                      'G':dlist:='Games';
                      'M':dlist:='Misc';
                      'U':dlist:='Uploads';
                  end;
                  for d:= 1 to length(dlist)do
                  dlist[d]:=upcase(dlist[d]);
                  writeln('Switching to ', dlist , ' directory. Please Wait.');
                  delay(3000);
                  case r of
                      'B':dumbbs;
                      'E':dumed;
                      'G':dumgame;
                      'M':dummis;
                      'U':dumup;
                  end;
end;
procedure fyles;
var
   fch   :   char;
begin
     fch:='!';
     while (fch<>'Q') and (fch<>'G') do
     begin
          clrscr;
          writeln('Switching to Files Section. Please wait.');
          delay(2000);
```

```
        begin
            textcolor(10);
            textbackground(0);
            clrscr;
            writeln('--------------------------Simulator Files
System-------------------');
            writeln;
            writeln('List.....List of Directories');
            writeln('Help.....Display Help File');
            writeln('Download....Receive a file from BBS');
            writeln('Goodbye.....Log off System');
            gotoxy(40,3);
            writeln('Quit.....Return to Main Menu');
            gotoxy(40,4);
            writeln('Upload.....Send a file to BBS');
            gotoxy(40,5);
            writeln('XProto.....Change Xfer Protocol');
            repeat
            fch:=readkey;
            fch:=upcase(fch);
            until fch in ['L','G','H','L','U','Q','X'];
                case fch of
                    'D' : dl;
                    'H' : aid('filehelp.hlp',45,12,80,24,0,7);
                    'L' : listdir;
                    'U' : ul;
                    'X' : xproto;
                    'G' : cont:=false;
                end;
            end;
        end;
end;

procedure main;
var
  year,mon,day,d          : word;
  more                    : char;
begin
    textcolor(14);
```

```
    textbackground(0);
    getdate(year,mon,day,d);
    user.laston.y:=year;
    user.laston.m:=mon;
    user.laston.d:=day;
    user.calls:=user.calls+1;
    putnewinfo;
    { Main Menu Section }
    more:='$';
    while more <>'G' do
        begin
            textcolor(14);
            textbackground(0);
            clrscr;
            writeln('------------------------------MAIN MENU
SECTION-----------------------');
            gotoxy(1,4);
            writeln('<B>ulletin Section.');
            writeln('<D>oors');
            writeln('<E>lectronic Mail.');
            writeln('<F>ile section.');
            writeln('<G>ood Bye.');
            writeln('<H>elp File.');
            gotoxy(40,4);
            writeln('<L>ist Sub-Boards.');
            gotoxy(40,5);
            writeln('<P>ost a message.');
            gotoxy(40,6);
            writeln('<R>ead messages.');
            gotoxy(40,7);
            writeln('<S>can messages.');
            gotoxy(40,8);
            write('<T>oggle Pop Ups ');
            if vuaid then
              writeln(' Off.')
            else
              writeln(' On.');
            gotoxy(40,9);
            writeln('<U>ser Information.');
```

```
                repeat
                    more:=readkey;
                    more:=upcase(more);
                until more in ['B','D','E','F','G','H','L','P','R','S','T','U'];
                case more of
                    'B': listbull;
                    'D': doors;
                    'E': mail;
                    'F': fyles;
                    'H': aid('mainhlp.hlp',45,12,80,24,0,7);
                    'L': listconf;
                    'P': post;
                    'R': reed;
                    'S': scan;
                    'T': toggle;
                    'U': aid('user.hlp' ,1,1,80,25,3,0);
                end;
            end;
end;
procedure inituser;
begin
    user.name:='';
    user.school:='';
    user.teach :='';
    user.phone :='';
    user.pass:='';
    user.laston.m:=0;
    user.laston.d:=0;
    user.laston.y:=0;
    user.calls:=0;
    user.mess:=0;
end;

procedure register;
var
  dum             : who;
  d               : integer;
  new             : char;
```

```
begin
    textcolor(14);
    textbackground(0);
    clrscr;
          Writeln('BBS Simulator - New User Menu');
          Writeln('[R].....Register as a new user');
          Writeln('[G].....Guest Account no longer available');
          Writeln('[C].....Call the Sysop to Chat');
          Writeln('[E].....Re-Enter Your Name');
          Writeln('[D].....Disconnect');
          Writeln('[H].....Help Menu');
          Write('Select-->');
    repeat
         Readln(gmore);
         gmore:=upcase(gmore);
    until gmore in ['R','G','C','E','D','H'];
    case gmore of
        'R':begin
                clrscr;
                Writeln('Please enter your registration information below. Phone
numbers');
                writeln('and password will be kept strictly confidential.');
                writeln;
                inituser;
                write('Enter Your Real First and Last Name Please   :');
                readln(user.name);
                for d:=1 to length(user.name) do
                   user.name[d]:=upcase(user.name[d]);
                user.calls:=0;
                user.mess:=0;
                write('Enter the name of your school :');
                readln(user.school);
                write('Enter your teachers name      :');
                readln(user.teach);
                for d:=1 to length(user.teach) do
                   user.teach[d]:=upcase(user.teach[d]);
                write('Enter your phone number       :');
                readln(user.phone);
                write('Enter a password              :');
```

```
                readln(user.pass);
                for d:=1 to length(user.pass) do
                user.pass[d]:=upcase(user.pass[d]);
                writeln;
                writeln('Thank you... switching to main program.');
                reset(uf);
                pos:=0;
                while not eof(uf) do
                     begin
                          pos:=pos+1;
                          read(uf,dum);
                     end;
                write(uf,user);
                cont:=true;
                delay(3000);
             end;
             'G':begin
                      writeln('Not available...');
                      delay(3000);
                 end;
             'C':begin
                      writeln('Sysop is NOT available for chatting.');
                      delay(3000);
                 end;
             'D':cont:=false;
             'H':aid('register.hlp',45,12,80,24,0,7);
          end;
end;

procedure logon;
var
  c : char;
begin
    textcolor(15);
    textbackground(0);
    clrscr;
    gotoxy(20,20);
    write('Select Graphics Mode <C>olor, <M>onochrome, <N>one ');
    delay(2000);
```

```
    if vuaid then aid('logon.hlp',10,1,50,12,0,7);
    c:=readkey;
end;
procedure get_user;
var
  d        :   integer;
  caller   :   st20;
  pw       :   st10;
  new      :   char;
begin
  textcolor(11);
  textbackground(0);
  clrscr;
    write('Enter your name or type NEW  ');
    readln(caller);
    for d:=1 to length(caller) do
       caller[d]:=upcase(caller[d]);
    if caller<>'NEW' then
          writeln('Please hold while I check...');
          {$I-}
          reset(uf);
          {$I+}
          if IOresult<>0 then
             rewrite(uf);
          pw:='';
          d:=0;
    begin
    while (not eof(uf)) and (caller<>user.name) do
        begin
            read(uf,user);
            if caller<>user.name then
               d:=d+1;
        end;
    pos:=d;
    if caller<>user.name then
      register
    else
       begin
          gmore:='R';
```

```
            write('Enter your password:  ');
            new:='!';
            repeat
                  new:=readkey;
                  if ord(new)<>13 then
                     pw:=pw+new;
                  write('.');
            until ord(new)=13;
            for d:=1 to length(pw) do
               pw[d]:=upcase(pw[d]);
            if pw=user.pass then
               begin
                  cont:=true;
                  writeln;
                  writeln('Your last call was on
',user.laston.m,'-',user.laston.d,'-',user.laston.y,'.');
                  writeln('You have made ',user.calls,' calls.');
                  writeln('You have sent ',user.mess ,' messages.');
                  delay(3000);
               end
            else
               begin
                  writeln('Sorry, invalid password.  Try again later.');
                  delay(3000);
                  end;
               end;
         end;
end;

begin
     cont:=false;
     assign(uf,'user.dat');
      login;
      logon;
      gmore:='!';
      while (gmore<>'R')  and (gmore<>'D') do
           get_user;
     if cont then
        begin
```

```
            listbull;
            main;
        end;
end.
```

```
program changer;
uses dos,crt;
type
   st12        =       string[12];
   st70        =       string[70];
   st20        =       string[20];
   st10        =       string[10];
   date= record
         m,d,y :       word;
   end;
   who = record
      name    :        st20;
      pass    :       st10;
      school  :        st20;
      teach   :       st20;
      phone   :        st20;
      laston  :       date;
      calls   :       word;
      mess    :        word;
   end;
   userfile    =       file of who;
   messarray   =         array[1..50] of st70;
   messtype    =         record
               flag    :     boolean;
               mes     :      messarray;
   end;
   messfile    =  file of messtype;
var
   user        :       who;
   gmore       :        char;
   uf          :       userfile;
   pos         :       word;
   cont        :       boolean;
   l           :      integer;
   fyle        :       string[8];
   hlp         :       text;  {message textfile variable}
   mess        :        messarray;
   messrec     :        messtype;
   m           :       messfile;
```

```
begin
    clrscr;
    write('Enter filename without extension:  ');
    readln(fyle);
    assign(m,fyle+'.dat');
    assign(hlp,fyle+'.txt');
    reset(m);
    rewrite(hlp);
    while not eof(m) do
        begin
            read(m,messrec);
            l:=1;
            while messrec.mes[l]<>'###' do
                begin
                    writeln(hlp,messrec.mes[l]);
                    l:=l+1;
                end;
        end;
    close(hlp);
    close(m);
end.
```

Appendix G

Appendix G

POST TEST RESULTS